INCOMPATIBILITIES

IN

PRESCRIPTIONS

FOR

STUDENTS IN PHARMACY AND MEDICINE
AND PRACTICING PHARMACISTS
AND PHYSICIANS

BY

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PREFACE TO THE FOURTH EDITION

As was stated in the preface to the first edition, the object of the first part of this book is to present to the busy prescriptionist in a convenient and condensed form the more common incompatibilities. The substances treated of are arranged in alphabetical order of their Latin names, except in case of some of the newer remedies. In order to avoid repetition all the incompatibilities of each substance are not always given under that heading. For instance, the reaction between two substances may be found under the heading of one of the substances and not under the other. The second object of the writer is to furnish the student of pharmacy with a list of incompatible prescriptions in such form that he may find out for himself what the trouble is, and the best means of avoiding or overcoming it. It is suggested that he study the prescription thoroughly before referring to the notes.

In this fourth edition the Author has added some remedies which have recently come into use. While there are many others which might be included, they are not generally given in combination and not likely to give rise to incompatibilities.

Physicians prescribe quite a number of proprietary remedies and so-called patent medicines, some of which cause trouble for the compounder. Not many of these remedies are mentioned in this book, because first, the number of such preparations is so large and the variation of those used in different localities is so great, it would be difficult to draw the line as to which should be admitted. Second, in many the ingredients are wholly unknown and in others only partially known. Third, the formulas are liable to be changed at any time, so that the ingredients now present may not be the same as those present six months from now.

In Part II the number of prescriptions has been increased by fifty. As in previous editions there are fifty prescriptions which

have no comments, being left for the student to study out for himself. The prescriptions are now arranged in order corresponding to that of the drugs in Part I. At the end of the monographs in Part I are given numbers of some prescriptions illustrating the incompatibilities mentioned in the monograph. Other prescriptions illustrating these incompatibilities can be found by reference to the Index of Prescriptions.

On account of so many incompatibilities being due to the formation of insoluble compounds, a table of solubilities was introduced in the second edition. This table has been enlarged and revised.

The table in previous editions, giving the average price charged for prescriptions has, through the courtesy of the Editor of the N. A. R. D. Journal, been replaced by the Schedule adopted by the National Association of Retail Druggists.

Vanderbilt University, 1917.

ABBREVIATIONS OF REFERENCES

Allen:	Allen's Commercial Organic Analysis, 3d ed.
A. D.:	American Dispensatory.
Am. D.:	American Druggist.
A. J. P.:	American Journal of Pharmacy.
A. P. A.:	Proceedings of the American Pharmaceutical Association.
Blyth:	Blyth's Poisons, 3d ed.
Br. P.:	British Pharmacopœia.
Bul. Phar.:	Bulletin of Pharmacy.
Caspari:	Caspari's Treatise on Pharmacy, 5th ed.
D. C.:	Druggist's Circular.
M. & M.:	Muir and Morley's edition of Watts' Dictionary.
M. R.:	Merck's Report.
Nat. Drug.:	National Druggist.
N. S. D.:	National Standard Dispensatory.
N. E. D.:	New England Druggist.
N. & N. Rem.:	New and Non-official Remedies.
Ph. E.:	Pharmaceutical Era.
Ph. J.:	Pharmaceutical Journal.
Ph. R.:	Pharmaceutical Review.
P. & J.:	Prescott and Johnson's Qualitative Chemical Analysis, 6th ed.
Potter:	Potter's Materia Medica, 10th ed.
Prescott:	Prescott's Organic Analysis.
R. & S.:	Roscoe and Schorlemmer's Organic Chemistry.
Richter:	Richter's Organic Chemistry, 3d Amer. ed.
Scoville:	Scoville's Art of Compounding, 4th ed.
Sohn:	Sohn's Dictionary of Active Principles of Plants.
Storer:	Storer's Dictionary of Solubilities.
U. S. D.:	United States Dispensatory.
U. S. P.:	United States Pharmacopœia, 9th revision.
W. D.:	Western Druggist.
Watts:	Watts' Dictionary of Chemistry.

INCOMPATIBILITIES IN PRESCRIPTIONS

PART I

INCOMPATIBILITIES

Acacia, *Gum Arabic.* — 1. An aqueous solution of acacia is acid to litmus, but is not sufficiently acid to cause trouble unless decomposition has commenced. In the formula of U. S. P. VIII, the mucilage was nearly neutral on account of the lime water in it. 2. The official mucilage of acacia is gelatinized by a **solution of ferric chloride, tincture of ferric chloride, solution of ferric sulphate,** or **solution of ferric subsulphate.** Alkali citrates in small proportions, alkali acetates in larger proportions, excess of hydrochloric or other acids, or dilution with water, will tend to prevent coagulation. One volume of tincture of iron with an equal volume of water will give a solution with one volume of mucilage diluted with an equal volume of water. Different samples of tincture chloride of iron vary in the amount of free acid and this causes a variation in the amount of citrate, acetate, acid, or dilution necessary to prevent gelatinization. Glycerin or syrup seems to have but little more effect in preventing coagulation than so much water. The color of the mixture of the iron salt and the mucilage is deeper red than that of the tincture alone. Gelatinized acacia will afterwards slowly dissolve if an excess of water is added. 3. **Solution of dialyzed iron** when mixed with mucilage of acacia forms gelatinous masses, having the color

NOTE. — At the end of the articles on many drugs and chemicals, numbers in parentheses will be found. These numbers refer to prescriptions in Part II illustrating that particular drug or chemical. By reference to the Index of Incompatibilities other prescriptions may be found arranged under other headings.

of ferric hydroxide, but does not give a translucent mass as does the tincture of iron; dilution with water or the addition of a citrate has but little effect in preventing coagulation. 4. The **solution of ferrous chloride** (N. F.), **iron citrate, iron** and **ammonium citrate,** or a saturated **solution of ferrous sulphate** does not gelatinize mucilage of acacia. 5. A saturated solution of **borax** forms a more or less translucent mass with mucilage of acacia. By diluting the borax solution with an equal volume of water, and the mucilage with an equal volume of water, no coagulation takes place. The coagulation may also be prevented by adding three or four drops of glycerin or honey to one dram of the borax solution, or by acidifying the borax solution. Either glycerin or honey decomposes borax to some extent, liberating boric acid, but not enough need be added to make the solution acid. The official syrup or a solution of glucose tends to prevent the coagulation, but is not as effective as glycerin. 6. A solution of **lead subacetate** (not the neutral lead acetate), even if quite highly diluted, will give white, opaque, gelatinous masses when mixed with mucilage of acacia. Diluting the mucilage with several volumes of water does not prevent coagulation although glycerin and syrup do to some extent. 7. Acacia consists chiefly of calcium arabate and a solution may have some of the incompatibilities of calcium salts. 8. Acacia is nearly insoluble in **alcohol.** The mucilage can be mixed with a little over one half its volume of alcohol without permanent precipitation. If the mucilage is first diluted with water a stronger alcoholic mixture can be obtained before precipitation is permanent. The precipitate redissolves on subsequent dilution with water. 9. **Sulphuric acid** converts acacia into arabic and then metarabic acid and precipitates calcium sulphate (U. S. D.). Dilute sulphuric acid converts it into a sugar on prolonged boiling (M. & M., I. 296). A strong solution of a sulphate gives a precipitate of calcium sulphate. 10. Dilute **nitric acid** converts acacia into mucic, saccharic, oxalic, and tartaric acids (U. S. D.). 11. In the presence of acacia, dilute solution of salts of **mercury, lead, copper, antimony, silver, iron,** or **arsenic** do not give precipitates with **hydrogen sulphide** or **alkaline sulphides,** although a colora-

tion may be produced. 12. Acacia prevents the precipitation of dilute solutions of salts of **mercury, antimony, aluminum, iron, calcium,** and some other metals by **alkali hydroxides** or **borax** and in some cases by **carbonates.** 13. Dilute solutions of **alkaloidal salts** in the presence of acacia are not precipitated by **potassium mercuric iodide, sodium phosphomolybdate,** or **tannic acid** (Allen, I. 426). These properties are common to many gums (M. & M., I. 296). The solution of the alkaloid must be very dilute or some precipitation will occur. 14. Mucilage of acacia is colored blue, either at once or after standing a short time, by a tincture of **guaiac** if the guaiac is fresh, but not with a guaiac that has been exposed to air and light for some time. A mucilage made from acacia tears may give the blue when one made from powdered acacia will not. This is probably due to a ferment in the tears which is destroyed by the heat necessary before powdering. Heating a mucilage of acacia to 100° C. for one hour destroys the ferment, without impairing the emulsifying powers (Ph. J., 1905, 620). 15. Bourquelot (Pharm. Zeitralh., Aug. 10, 1905, Am. D., XLVII, 239) states that acacia contains an oxydase which gives colors when a ten per cent solution of acacia is mixed with a one per cent solution of carbolic acid, naphthol, pyrogallol, cresol, thymol, guaiacol, vanillin, pyramidon, morphine, apomorphine, physostigmine, adrenalin, barbaloin, tannin, preparations of tar, and other compounds. (℞ 1–9.)

Acetanilidum, *Antifebrin.* — 1. With **spirit of nitrous ether, amyl nitrite,** or a solution containing **nitrous acid,** acetanilid gives a yellow solution, becoming red on standing for some time. With a fresh or nearly neutral spirit of nitrous ether the yellow coloration may not be noticed for several days and the red for two weeks or more. The presence of an alkali or a little sodium bicarbonate will prevent the appearance of more than a pale yellow within a month. Probably diazo-compounds are formed. 2. A cold **solution of ferric chloride** with acetanilid gives no increase of color, but, if heated, it assumes a deep red color which fades as the solution cools. With the **tincture of iron** acetanilid gives a color more red than the tincture, acetanilid being soluble

in alcohol. Excess of acid lessens the color. 3. **Iodine, bromides,** or **iodides** do not precipitate aqueous solutions of acetanilid unless they are added in very large excess. **Bromine** gives a white precipitate. 4. **Acids** generally hydrolyze it. 5. Acetanilid is slowly decomposed by a strong solution of **potassium** or **sodium hydroxide,** forming aniline. 6. A mixture of acetanilid and **calomel,** either dry or with water, shows no perceptible change within a month and gives no test for a mercuric salt. 7. Rubbing acetanilid with **chloral alcoholate, piperazine, phenol, pyrocatechin, resorcin,** or **thymol** produces a soft mass or liquid which is soluble in alcohol and insoluble or only partly soluble in water. 8. Heavy trituration of acetanilid with **antipyrine** or **chloral hydrate** gives a damp powder. 9. **Chloral hydrate** increases the solubility of acetanilid in water; a mixture of ten grains of chloral hydrate with one grain of acetanilid will dissolve in about five minims of water and further addition of water does not cause precipitation. 10. When **sodium salicylate** is mixed with acetanilid a pink powder is said to be produced, but the writer did not get much increase of color, although the paper containing the mixture became colored after a time. 11. Acetanilid is said to be readily soluble in a hot solution of **tartaric acid** from which it does not crystallize. However, the writer did not find this to be the case. (℞ 10–12.)

Acetozone, *Benzoyl-acetyl Peroxide.* — 1. Acetozone is hydrolyzed by **water,** liberating oxygen slowly in the nascent condition. It is decomposed in contact with solutions of **alkalies** or heated **with water.** 2. Heating, grinding, compressing, or pounding will often bring about a decomposition. 3. It is gradually decomposed by all solvents except neutral petroleum oils.

Acetphenetidinum, *Phenacetin.* — 1. Phenacetin in strong aqueous solution gives with **chromic acid, chlorine, chlorinated lime, iodine,** and some other **oxidizing agents,** colorations varying from pink to red. These colorations are due to the presence of paraphenetidin in the phenacetin, or upon its formation by decomposition of the phenacetin (M. R., IV. 359). 2. Heating phenacetin with hydrochloric acid and **then** adding a solution of **ferric chloride** gives a red color. 3. **Salicylic acid**

when triturated with phenacetin is said to give a pasty mass. The writer failed to get anything but a dry powder. 4. Phenacetin triturated with **carbolic acid, chloral hydrate,** or **pyrocatechin** gives a liquid. 5. It is decomposed by strong acids or **alkalies.** 6. Phenacetin combines with **iodine** to form a compound known as iodophenin. 7. Phenacetin conceals the fluorescence of **quinine sulphate,** especially in dilute solutions. 8. **Spirit of nitrous ether** slowly gives a yellow color, becoming more of a red brown. (℞ 13–15.)

Acids. — 1. Acids combine with **metallic oxides** and **hydroxides,** with some **metals,** and with some **alkaloids** to form salts. Basic metallic salts are generally insoluble or sparingly soluble while most acid metallic salts are soluble. 2. Mineral acids and some organic acids, such as tartaric or acetic, precipitate bismuth citrate from solutions of **bismuth and ammonium citrate** by combining with the ammonium. 3. Mineral and common organic acids precipitate potassium bitartrate from concentrated solutions of **Rochelle salt,** normal **potassium tartrate,** or double tartrates containing potassium. 4. Nitric, hydrochloric, or sulphuric acid with an aqueous solution of **tartar emetic** gives a precipitate consisting of a basic nitrate, chloride, or sulphate of antimony. The presence of tartaric acid prevents precipitation, the amount of acid necessary seeming to depend upon the amount of mineral acid used. 5. Mineral acids give a precipitate of the phosphate or the pyrophosphate of iron when added to a solution of the **soluble phosphate** or **pyrophosphate of iron.** 6. Strong mineral acids precipitate, from concentrated solutions of **borates, salicylates,** or **benzoates,** the boric, salicylic, or benzoic acid. 7. Strong mineral acids form esters and ethers with **alcohol.** Many organic acids in the presence of mineral acids, as sulphuric or hydrochloric, form esters with alcohol. 8. Nearly all acids, except hydrocyanic and hydrosulphuric, decompose **carbonates,** liberating carbon dioxide. 9. Acids diminish or prevent the action of **pancreatin.** 10. Many acids precipitate **albuminous substances** from aqueous solution. 11. Organic acids, except acetic, combined with an alkali, generally form compounds with the **heavy metals,** that are insoluble in

water. 12. Frequently mineral acids displace organic acids and the stronger mineral acids the weaker ones.

The following official preparations contain a free acid: 13. the vinegar of squills; 14. chlorinated lime; 15. citrated caffeine; 16. fluidextracts of ergot, ipecac, lobelia; 17. fluidextracts in general are acid to litmus, some sufficiently acid to liberate carbon dioxide from carbonates; 18. glycerites of tannic acid and boroglycerin; 19. solutions of arsenous acid, ammonium acetate, chloride of iron, iron and ammonium acetate, subsulphate of iron, tersulphate of iron, hydrogen dioxide, magnesium citrate, potassium citrate, and zinc chloride; 20. oleate of mercury; 21. spirit of nitrous ether, usually; 22. syrups of citric acid, hydriodic acid, orange, calcium lactophosphate, ferrous iodide, hypophosphites, ipecac, lactucarium, and squills; 23. tinctures of chloride of iron, camphorated opium, and sanguinaria; 24. ointments of boric acid, tannic acid, and mercuric nitrate. 25. Besides these there are some substances which become acid on exposure, as acetic ether, spirit of nitrous ether, amyl nitrite, and oil of bitter almonds.

26. There are quite a number of salts that are acid in reaction and sufficiently so to give an effervescence with a carbonate. Some of the more common are: alum, bismuth subnitrate, copper sulphate, ferric chloride, ferric phosphate, ferrous sulphate, potassium bitartrate, quinine bisulphate, quinine dihydrochloride, quinine and urea hydrochloride, zinc acetate, zinc chloride, zinc sulphate, zinc valerate, and saccharin.

Acidum Aceticum. — 1. Acetic acid decomposes nearly all **carbonates,** liberating carbon dioxide and forming acetates. 2. It forms chloracetic acid with **chlorine,** slowly in diffused light, more quickly in sunlight. 3. Soluble neutral acetates, or the free acid if it is concentrated and the solution of iron salt is weak, with solutions of **ferric salts,** give a deep red coloration. The color varies from a yellow red to a dark red, according to the dilution, due to the formation of ferric acetate which on heating precipitates as the basic ferric acetate. The strong mineral acids in excess prevent the formation of the color. 4. Acetic

acid aids the solution of **quinine sulphate** in water, increasing the fluorescence. This solution does not precipitate on standing, but on adding potassium acetate the fluorescence is destroyed and, if it is a fairly strong solution of quinine, needle-shaped crystals will be formed in a few minutes. Experiments made indicate that double decomposition takes place, forming quinine acetate and potassium sulphate. The precipitation may be due partly to the quinine acetate being only sparingly soluble and partly to the quinine salt being less soluble in a solution of potassium acetate. The precipitate formed may be dissolved by the further addition of acetic acid and again thrown down by adding potassium acetate, the amount of potassium acetate necessary seeming to depend on the excess of acetic acid used. It may be that the potassium acetate combines with the acetic acid (as explained in R. & S., III. part I. 497), forming potassium diacetate, thus taking up the free acid. Potassium acetate in sufficient amount will destroy the fluorescence and give a precipitate with a solution of quinine bisulphate or quinine sulphate dissolved in water by the aid of sulphuric acid. It has been suggested that quinine hydrate is formed, the acetic acid being too weak to hold the hydrate in solution (M. R., IX. 158). 5. A mixture of **alcohol, sulphuric acid,** and acetic acid or an acetate gives ethyl acetate, which has a fruity odor. 6. An aqueous solution of potassium acetate with **spirit of nitrous ether** produces an effervescence. The effervescence may be due to the potassium acetate throwing the volatile ethyl nitrite out of solution; salts upon which ethyl nitrite has no action cause a similar effervescence. 7. The stronger **mineral acids** transpose acetates, liberating acetic acid. 8. Acetic acid is not sensibly affected by **nitric acid** or readily changed by **oxidizing agents.** 9. Strong acetic acid is a good solvent for **resins, gum-resins, camphor,** and **volatile oils.** 10. Some acetates, as lead, on being exposed to the **air** lose acetic acid and absorb carbon dioxide, becoming partly insoluble. 11. Nearly all normal acetates are readily soluble in water, except quinine, silver, and mercurous. The acetates, except silver and mercurous, are generally soluble in alcohol. [See ACIDA.] (℞ 16–18.)

Acidum Acetylsalicylicum, *Aspirin.* — 1. Aspirin in solution decomposes slowly into acetic and salicylic acids, and then has the incompatibilities of these acids. 2. It is decomposed by **alkalies,** forming acetates and salicylates; with **carbonates,** carbon dioxide is liberated. 3. In solution with **potassium iodide** it slowly liberates hydriodic acid, which is oxidized by the air, liberating iodine. 4. It does not give a violet color with a solution of **ferric chloride** unless it is decomposed. 5. It gives no reaction with **silver nitrate.** 6. Its solubility is greatly increased by the presence of alkali citrates and acetates. (℞ 19–21.)

Acidum Benzoicum. — 1. Benzoic acid combines with the **hydroxides** of the **alkalies** and **calcium** to form benzoates. 2. It liberates carbon dioxide from **carbonates.** 3. Soluble benzoates precipitate nearly neutral solutions of **ferric salts** as ferric benzoate, which is flesh colored. The presence of an excess of free acid or of alkali tartrates or citrates interferes with or prevents the precipitation. 4. Sodium benzoate gives precipitates with solutions of salts of **silver, mercury,** and **lead,** the latter being somewhat soluble in excess of lead acetate. 5. Sodium benzoate gives a white, sticky precipitate when it is added to a solution of **quinine bisulphate** or to a slightly acidulated solution of **quinine sulphate** if the quinine solution is not too dilute. Quinine benzoate is soluble in about 350 parts of water and more soluble in alcohol. 6. **Hydrogen dioxide** with a little sulphuric acid converts benzoic acid into salicylic acid (M. & M., I. 470). 7. Benzoic acid is not readily attacked by **nitric** or **chromic acid.** 8. Concentrated aqueous solutions of benzoates give a crystalline precipitate of benzoic acid when dilute solutions of strong **acids** are added. Some acids in fruit syrups precipitate benzoic acid when sodium benzoate is used as a preservative. 9. The solubility of the free acid in water is increased by the presence of borax, alkali citrates, sodium phosphate, or sodium sulphite. 10. Most benzoates are soluble in water and many are soluble in alcohol. The more sparingly soluble benzoates dissolve readily in aqueous solutions of sodium acetate, lead acetate, or sodium nitrate (Storer, 61). [See ACIDA.] (℞ 22–24.)

Acidum Boricum. — 1. Boric acid combines with the **hydroxides** of the **alkalies** and the **alkaline earths** to form borates. 2. It decomposes **carbonates** of the **alkalies** and of the **alkaline earths,** liberating carbon dioxide, but under certain conditions carbon dioxide may decompose borates. 3. The alkali borates, as borax, give precipitates with nearly neutral solutions of salts of several **metals,** the precipitate being more or less soluble in excess of the metallic salt or in the presence of ammonium chloride (Watts, I. 641); 4. with **mercuric chloride** the precipitate is red brown basic mercuric chloride (Watts, I. 641); 5. with **silver nitrate** the precipitate is silver borate (sometimes mixed with a little oxide); 6. with **lead acetate, barium chloride,** or **calcium chloride** the precipitate is a borate of the metal (P. & J., 246); 7. with **alum** the precipitate is aluminum hydroxide; 8. with **zinc sulphate** the precipitate may be chiefly a borate or a mixture of the borate with a basic compound, there being more of the borate if the solutions to be mixed are concentrated; 9. with **ferric salts** a basic borate is formed (Watts, I. 530). 10. Very concentrated solutions of borates give a precipitate of boric acid with nearly all **mineral acids.** 11. Borax with many of the weaker **acids** forms double salts in which boric acid seems to act the part of a base. When borax and **tartaric acid** are mixed in solution in proper proportions boric acid separates; if the quantity of tartaric acid is gradually increased, the quantity of boric acid also increases up to a certain point, beyond which it decreases, acting the part of a base (Watts, I. 648). 12. Borax is alkaline in reaction and precipitates the free **alkaloids** from aqueous solutions of their salts. This can be prevented by first mixing a little glycerin with the borax. 13. **Glycerin** and borax react in the presence of water, liberating boric acid. [See GLYCERIN, No. 1.] Glucose, mannite, some other forms of sugar, and honey cause a similar reaction. 14. In solution borax slowly decomposes **chloral hydrate,** liberating chloroform. 15. When triturated with alum, benzoic, gallic, salicylic, or tartaric acid, borax gives a damp powder or sticky mass. Chemical reaction takes place and water of crystallization is liberated. 16. Borax coagulates mucilage of **acacia.** [See

of some metallic salts. 16. Potassium citrate dissolved **in dilute alcohol** (one part of the salt to six of the solvent) **causes the** liquid to separate into two layers, the upper being nearly twice the volume of the lower. Potassium citrate is insoluble in alcohol and in separating takes some water with it. 17. The citrates of the alkalies are soluble in water; those of iron, zinc, calcium, and copper are moderately soluble; the other single citrates are nearly insoluble. Citric acid in excess converts the insoluble citrates into the more soluble acid citrates, and the alkali citrates convert them into the more soluble double citrates. 18. Syrup of lemon or of citric acid, when used as a vehicle, sometimes causes precipitation or reaction on account of citric acid. In such a case it is often admissible to use simple syrup flavored with oil of lemon. [See ACIDA.] (℞ 34–35.)

Acidum Gallicum. — 1. An aqueous solution of gallic acid soon decomposes when exposed to air, giving off carbon dioxide, turning yellow, brown, and black, and depositing a black substance; this coloration is hastened by alkali hydroxides and in alkaline solution the gallic acid is converted into galloflavin (Richter, II. 230). 2. Gallic acid combines with **alkali hydroxides.** In mixtures of the acid and a solution of potassium or sodium hydroxide, when the acid is in excess, the color becomes green; when the alkali is in excess, the color is yellow, changing to red and brown. 3. Gallic acid in excess with **ammonia water** gives a yellow color, but when the ammonia is in excess the color is red brown. 4. It decomposes alkali **carbonates** liberating carbon dioxide and producing colorations similar to those given when added to fixed alkali hydrates. 5. With an excess of **sodium bicarbonate** a solution of gallic acid turns brown, then green and ultimately blue, and gives a precipitate of a deep blue green solid. 6. Gallic acid with **lime water** in excess gives a blue white precipitate, and the liquid acquires a tint which is blue by reflected and green by transmitted light, and becomes pink with a large excess of lime water. If the acid is in excess the color is brown. 7. Gallic acid gives a blue black solution or precipitate with a solution of **ferric chloride.** With an excess of the iron the color is green blue to a green brown. Heat changes the blue black

color to brown, probably due to the reduction of the ferric iron to the ferrous condition, and to the conversion of gallic acid into pyrogallic or metagallic acid. 8. Gallic acid with a strong solution of a pure **ferrous salt** gives a white precipitate. On exposure to air the mixture soon becomes colored, due to the oxidation of the iron. 9. With a solution of **potassium cyanide** gallic acid gives a transient red color. 10. With a solution of **tartar emetic** it gives a precipitate of gallate of antimony; in dilute solution the precipitation is prevented by ammonium chloride. 11. Gallic acid produces a precipitate when added to a solution of **lead acetate.** 12. It reduces salts of **silver** and **gold** to the metals. 13. Oxidizing agents, such as **arsenic acid** and **iodine,** with water convert gallic acid into elagic acid (Richter, II. 230). Iodine with gallic acid gives hydriodic acid and oxidation products of gallic acid (N. S. D.). Arsenic converts it into tannic acid without the production of arsenous acid (Chem. News, XXIX. 73). 14. Triturating gallic acid with **potassium permanganate** may cause the acid to take fire. 15. With **spirit of nitrous ether** gallic acid or a solution of gallic acid produces an effervescence and gives a red color. 16. Gallic acid does not precipitate solutions of alkaloids, gelatin, albumin, or starch, but a mixture of **gum acacia** and **gelatin** is said to be precipitated. 17. The solubility in water of the free acid is increased by borax or alkali citrates. 18. The gallates of the alkalies are soluble, but the others are nearly insoluble in water and generally insoluble in alcohol. (℞ 36.)

Acidum Hydriodicum. — 1. Hydriodic acid, syrup of hydriodic acid, or syrup of ferrous iodide on being exposed to **air** and **light** liberates iodine; the hypophosphorous acid in them prevents the change for a time. Exposed to sunlight for a month eighty per cent of the hydriodic acid is decomposed (M. R., XII. 228). These syrups sometimes become colored brown on account of caramelization of sugar. Ammonium iodide is soon decomposed by air and light, potassium iodide much less quickly, particularly if it contains a little potassium carbonate. 2. Solutions of iodides **with** dilute mineral **acids** or some organic acids liberate hydriodic acid, which is more or less quickly oxidized to iodine by the **oxygen of the air.** Some neutral salts, as ammonium nitrate,

tend to decompose iodides. 3. Hydriodic acid and soluble iodides precipitate solutions of salts of **lead,** as the bright yellow lead iodide. This is prevented to some extent by alkali acetates. 4. They precipitate salts of **silver,** as the yellow white silver iodide; of **mercurous mercury,** as the yellow mercurous iodide; of **mercuric mercury,** as the red mercuric iodide. 5. The alkali iodides in excess form double compounds with **lead, silver,** and **mercuric iodides.** The iodides of lead and silver are soluble only in concentrated solutions of the alkali iodides while mercuric iodide is readily soluble in dilute solutions. The solution of the double salt of mercuric and potassium iodide $(KI)_2HgI_2$ is known as "Mayer's reagent," and precipitates nearly all alkaloids from their aqueous solutions. Potassium iodide given with insoluble mercury preparations makes them more soluble and active. (A. J. P., XXVI. 222). 6. **Mercurous iodide** with an excess of potassium iodide in the presence of water is decomposed, forming metallic mercury and mercuric iodide, the latter combining with potassium iodide to form the potassium mercuric iodide. 7. **Calomel** with water and an excess of potassium iodide forms mercurous iodide and potassium chloride; the mercurous iodide is decomposed as given under No. 6. 8. Soluble iodides reduce **cupric salts** in solution and give a white precipitate of cuprous iodide; at the same time the solution turns red, due to the liberation of iodine. 9. Soluble iodides with **ferric salts** in acid solutions reduce the ferric to ferrous iron, but give no precipitate of iron; iodine is liberated and, if all of the iodide is decomposed, may be precipitated. Adding potassium iodide to tincture citrochloride of iron, little or no iodine is liberated for several days, but if a little dilute mineral acid is added iodine is liberated at once. 10. When **bismuth subnitrate** is added to syrup of hydriodic acid it is changed to a yellow substance at once which further changes to orange red and then to dark gray. Sometimes the ultimate precipitate seems to consist of two different substances, one yellow and the other gray. When bismuth subnitrate is added to a solution of potassium iodide it assumes a yellow color in a few hours and within a day it has changed to a deep red. The color varies with the iodide formed; BiOI is red; $3BiOI,4Bi_2O_3$ is

yellow; BiI_3 is dark gray (M. & M., I. 513). Sodium bicarbonate in an amount equal to that of bismuth prevents the change. Diluted hydrochloric acid causes the coloration to take place at once. Syrup of ferrous iodide gives a yellow color at once, turning red brown in a short time. 11. **Spirit of nitrous ether,** and **nitrites** in acid solution, liberate iodine from iodides and give off oxides of nitrogen. To prevent these reactions the spirit should first be neutralized by a little sodium bicarbonate. 12. **Nitric** or **nitrohydrochloric acid** liberates iodine from iodides and, if sufficiently concentrated, oxidizes it to iodic acid. 13. **Chlorine** oxidizes iodides, forming iodine then iodic acid and in an alkaline mixture a periodate. The chlorine is changed to a chloride. 14. **Chlorates** in an acid solution of an iodide liberate iodine and then change it to iodic acid which is more toxic. Probably a similar reaction takes place in the stomach when a chlorate and an iodide are taken together. 15. **Iodates** in acid solution with iodides liberate iodine from both. Iodides sometimes contain iodates as impurities, hence the liberation on adding an acid. 16. **Arsenic compounds** in acid solution with iodides liberate iodine and become arsenous. 17. A solution of potassium iodide with **arsenous acid** or **potassium arsenite** yields a precipitate of $2KI,3As_2O_3$ which is sparingly soluble in cold water (Watts, I. 377). When one dram of potassium iodide is added to one fluid dram of the U. S. P. solution of potassium arsenite, a white precipitate forms in a few hours; if half that amount of iodide is added the precipitation may not take place for several days. 18. **Chromates** in acid solution liberate iodine and form chromic salts. 19. **Permanganates** in acid solutions liberate iodine and, if in great excess, oxidize it to iodic acid. 20. **Hydrogen dioxide** in acid solution liberates iodine from iodides, slowly in neutral mixtures. 21. The iodides sometimes contain carbonates and would then have the incompatibilities of the carbonates. 22. The alkali iodides precipitate aqueous solutions of many **alkaloidal salts.** In some cases this is due to the formation of compounds that are less soluble in water than the original salt. When a large excess of the alkali iodide is used it may render the alkaloidal salt less soluble in the solution than it is in

water. The precipitation in other cases is due to the carbonate occurring as an impurity in the iodide. The presence of alcohol prevents the precipitation to a considerable extent. The prescribing of strychnine sulphate with potassium iodide is particularly dangerous because the precipitation may not take place for some time. A solution of one twelfth of a grain of strychnine sulphate with five grains of potassium iodide and two drams of water does not usually precipitate at once, but may do so within a few hours. 23. The lead, silver, mercurous, mercuric, cuprous, bismuth, and stannous iodides are nearly insoluble in water; all others are soluble. Nearly all iodides, except lead, silver, and mercurous, are soluble in alcohol. [See ACIDA.] (℞ 37–50.)

Acidum Hydrobromicum. — 1. The soluble bromides and hydrobromic acid precipitate solutions of salts of **lead, silver, and mercurous mercury** as bromides. 2. In concentrated aqueous mixtures alkali bromides form double soluble compounds with lead or silver bromide, which double compounds are broken up by a large amount of water. 3. An aqueous solution of an alkali bromide or of hydrobromic acid causes **calomel** to turn black and the filtrate gives a test for a mercuric salt. Probably a reaction takes place similar to the one explained under ACIDUM HYDRIODICUM, Nos. 6 and 7. 4. Dilute hydrobromic acid with **bismuth subnitrate** gives a mixture in which the liquid has a pale yellow color. With potassium bromide there is no apparent change. 5. Bromides with **nitric acid** give bromine. 6. **Chlorine** forms bromine and hydrochloric acid. In alkaline mixtures a bromate is formed. 7. **Chlorates** in acid solution give bromine and hydrochloric acid. 8. Bromides in acid solutions reduce **permanganates** to manganous salts and liberate bromine. 9. **Chromates** in acid solution with bromides form chromic salts and bromine. 10. The alkali bromides precipitate some of the **alkaloids** from the solutions of their salts similar to the alkali iodides [see ACIDUM HYDRIODICUM No. 22] but are not apt to do so. The presence of alcohol generally prevents this precipitation. 11. The alkali bromides sometimes contain carbonates as impurities and would then have the incompatibilities of carbonates and the solution would be alkaline. 12. The metallic

bromides are soluble in water, except lead, mercurous, silver, antimony, and bismuth. They are generally somewhat soluble in alcohol. [See ACIDA.] (℞ 51–53.)

Acidum Hydrochloricum. — 1. Hydrochloric acid and the soluble chlorides precipitate as chlorides solutions of salts of **lead, silver,** and **mercurous mercury.** 2. With a solution of **tartar emetic** hydrochloric acid gives a precipitate of basic chloride of antimony. 3. Hydrochloric acid with **chlorates** gives chlorine and various chlorides of oxygen. 4. Concentrated hydrochloric acid with concentrated **nitric acid** gives chlorine and oxychlorides of nitrogen. 5. **Permanganates** liberate chlorine from hydrochloric acid and are reduced to manganous chloride. 6. **Chromates** form chromic chloride and free chlorine. 7. Bismuth citrate is precipitated from a solution of **bismuth and ammonium citrate** when hydrochloric acid is added to it. 8. Some writers say that chlorides aid the conversion of **calomel** to mercuric chloride. [See HYDRARGYRI CHLORIDUM MITE, No. 7.] 9. The soluble chlorides give hydrochloric acid when treated with **sulphuric acid.** 10. Hydrochloric acid, being stronger than most other acids, except sulphuric and nitric, very frequently displaces other acids when they are combined with bases. 11. The soluble chlorides when added so as to make a concentrated solution with a solution of an **alkaloidal salt** may precipitate the alkaloid. 12. Hydrochloric acid added to an alcoholic solution of **myrrh** slowly gives a red to a violet color; added to an alcoholic solution of **balsam of Tolu** it gives a yellow color, changing through brown to cherry red; with many **resins** a brown color is produced. 13. The normal chlorides, except lead, mercurous, and silver, are soluble in water. With the exception of chlorides of sodium, potassium, ammonium, silver, lead, and mercurous, they are generally soluble in alcohol. [See ACIDA.] (℞ 54–55.)

Acidum Hydrocyanicum Dilutum. — 1. The aqueous solution of hydrocyanic acid decomposes into ammonium formate, cyanic acid, and other compounds, depositing reddish brown paracyanogen. 2. Potassium cyanide in aqueous solution is decomposed on standing, giving potassium formate and ammonia (Watts II. 218). 3. An aqueous solution of potassium cyanide is

quite strongly alkaline, and this alkalinity increases with exposure, due to the absorption of carbon dioxide and the volatilization of the hydrocyanic acid. The commercial salt generally contains some potassium cyanate (KCNO) having taken the oxygen from air. 4. Concentrated **mineral acids** produce formic acid and a salt of ammonium (Watts, II. 199). 5. Hydrocyanic acid and the soluble cyanides, except mercuric cyanide, precipitate the white silver cyanide from solutions of **silver salts**; the precipitate forms soluble double compounds with the alkali cyanides. 6. They decompose **mercurous compounds**, forming metallic mercury and mercuric salts. In case of **calomel** the powder is turned dark at once on account of the metallic mercury. 7. The alkali cyanides precipitate solutions of **lead salts** as white lead cyanide. 8. The alkali cyanides precipitate solutions of **copper salts** as the yellow green copper cyanide, which is soluble in excess of the alkali cyanide. 9. Potassium cyanide with a solution of **ferrous sulphate** gives a brown precipitate of ferrous cyanide which dissolves in excess of the alkali cyanide forming potassium ferrocyanide. 10. **Nitric acid** decomposes cyanides with the evolution of nitrogen and other gases (N. S. D.). 11. Cyanides reduce **potassium permanganate** and are changed to carbon dioxide, nitric, nitrous, oxalic, and formic acids (M. & M., II. 346). 12. **Chlorine** or **chlorinated lime** with a solution of potassium cyanide forms chloride of cyanogen and hydrochloric acid (M. & M., II. 302). 13. With a concentrated solution of **iodine** potassium cyanide forms potassium iodide and iodide of cyanogen (M. & M., II. 342). Even in dilute solutions the color of iodine is destroyed. 14. Rubbed with **potassium nitrate** or **chlorate**, potassium cyanide detonates violently. 15. If potassium cyanide and **chloral hydrate** are rubbed together reaction takes place with the evolution of a large volume of white fumes. 16. Aqueous solutions of the alkali cyanides being alkaline may precipitate **alkaloids** from solutions of their salts as the free alkaloids. 17. Cyanides of the alkalies and alkaline earths are decomposed by all **acids**, even carbonic, with the liberation of hydrocyanic acid. 18. The cyanides of the alkalies and the alkaline earths and mercuric cyanide are soluble in water;

many of the others are made soluble in the presence of the alkali cyanides by forming double compounds. Excepting mercuric cyanide they are generally insoluble in alcohol. 19. **Atropine** and **ammonia** are physiologically antagonistic to cyanides in that they quicken the heart beat. (℞ 56–60.)

Acidum Hypophosphorosum Dilutum.—1. Dilute hypophosphorous acid is oxidized to phosphorous and phosphoric acids on exposure to **air**. 2. Hypophosphorous acid and hypophosphites in acid solution are oxidized to phosphoric acid by nearly all **oxidizing agents,** and cause a reduction of these agents. 3. **Nitrous** or **nitric acid** forms nitric oxide. 4. **Sulphurous acid** forms sulphur. 5. **Chlorine** and **chlorates** are changed to hydrochloric acid or chlorides. 6. **Iodine** is reduced to hydriodic acid. 7. **Mercurous** and **mercuric compounds** are reduced to the metal, even in neutral and alkaline mixtures. **Calomel** is turned dark at once when mixed with potassium hypophosphite. 8. **Permanganates** are changed to manganous compounds (to manganese dioxide in alkaline mixtures). 9. **Chromates** form chromic salts. 10. **Cupric sulphate** with hypophosphorous acid gives a precipitate of cuprous hydride which begins to form after an hour or more. Copper sulphate with potassium hypophosphite gives a white precipitate. 11. **Bismuth subnitrate** with potassium hypophosphite in the presence of moisture becomes brown or black after some time, much more quickly in the presence of an acid. Bismuth is reduced to metallic bismuth (P. & J., 296). 12. In the presence of hydrochloric acid **arsenic acid** is reduced to arsenous acid and then to metallic arsenic (P. & J., 296). 13. **Ferric salts** are reduced to ferrous in acid mixture (P. & J., 296). When an alkali hypophosphite is added to a solution of ferric chloride a white precipitate of ferric hypophosphite is formed which is dissolved by adding a large excess of hydrochloric acid or an alkali citrate in considerable amount. 14. Compounds of **silver** and **gold** are reduced to the metals. 15. Hypophosphorous acid dissolves **quinine sulphate** with a blue fluorescence. Adding potassium hypophosphite to the solution destroys the fluorescence and in sufficient amount precipitates the quinine. 16. Hypophosphites are decomposed by nearly all

acids. 17. Heat decomposes hypophosphites, giving off inflammable hydrogen phosphide gas. The mass remaining is often colored with a little phosphorus and the phosphite is changed to phosphate and pyrophosphate. A temperature of the water-bath may cause explosion. 18. Hypophosphites when triturated with some **oxidizing agents,** as potassium chlorate, are apt to cause an explosion. 19. Hypophosphites are soluble in water, except ferric hypophosphite which is only sparingly soluble. Many are soluble in alcohol. [See ACIDA.] (℞ 61–66.)

Acidum Lacticum. — 1. Lactic acid displaces acetic and carbonic acids from their compounds. 2. It coagulates a solution of **albumin.** 3. With **nitric acid** it forms **oxalic** acid (N. S. D.). 4. With **potassium permanganate** and sulphuric acid it gives the odor of aldehyde (U. S. P., 17). With potassium permanganate it gives pyruvic acid (M. & M., III. 110). Oxidized with potassium permanganate it yields pyroracemic acid (Richter, I. 336). 5. **Hydriodic acid** at once reduces lactic acid to propionic acid (Richter, I. 336). 6. Lactates are generally insoluble in water and alcohol but some are soluble in solutions of alkali citrates. [See ACIDA.]

Acidum Meconicum. — 1. Meconic acid, with a nearly neutral solution of a **ferric salt,** gives a red-colored solution, the color being destroyed by large excess of hydrochloric acid. 2. It gives a white precipitate with solutions of **lead acetate, silver nitrate, barium chloride,** and **calcium chloride.**

Acidum Nitricum. — 1. Nitric acid is a strong oxidizing agent, and in oxidizing substances it is reduced to dinitrogen tetroxide (N_2O_4), nitrous anhydride (N_2O_3), nitric oxide (NO), nitrous oxide (N_2O), nitrogen, or ammonia. 2. Nitric acid oxidizes **hypophosphites** to phosphates; 3. **sulphides** to sulphur, and then sulphates; 4. **sulphites** to sulphates; 5. **bromides** to free bromine; 6. **iodides** to free iodine, and then to iodic acid; 7. **oxalates** to carbon dioxide; 8. **citrates** to acetic and oxalic acids and carbon dioxide; 9. **mercurous compounds** to mercuric; 10. **arsenous compounds** to arsenic; 11. **ferrous compounds** to ferric. 12. Nitric acid dissolves many **metals,** while it itself is partly decomposed. 13. With concentrated **hydrochloric acid** it forms

chlorine and oxychlorides of nitrogen. 14. With **carbolic acid** it forms picric acid. 15. Nitric acid reacts with **tannic acid,** giving off oxides of nitrogen. 16. With **salicylic acid** it forms nitro-salicylic acid. 17. With **alcohol** it acts violently, giving off red fumes, and forming aldehyde, acetic, formic, and carbonic acids. 18. With **creosote, volatile oils,** and other **organic substances** the reaction with nitric acid may be so violent as to cause explosion or ignition. 19. Nitric acid gives color reactions with many of the alkaloids. **Apomorphine** with nitric acid gives a violet red; 20. **brucine** a scarlet to blood red; 21. **physostigmine,** a yellow or red; 22. **berberine,** a dark brown red; 23. **codeine,** a yellow; 24. **hydrastine,** an orange; 25. **morphine,** an orange red, changing to yellow. 26. Nitric acid gives a red color with **barbaloin** and **nataloin,** but not with **socaloin.** 27. Nitric acid replaces many weak acids, such as carbonic, acetic, and boric acids, when they are combined with bases. 28. Nitric acid with concentrated sulphuric acid and **glycerin** forms the explosive nitroglycerin. 29. With sulphuric acid and **cotton** or other **cellulose** it forms gun-cotton, some of the compounds being explosive. 30. Nitric acid with **sugar** and heat forms oxalic acid. Very concentrated nitric acid in the cold with sugar forms an explosive compound. Dilute nitric acid oxidizes sugar to saccharic acid, while very dilute acid changes it to glucose. 31. Nitric acid with **silver** or **mercuric nitrates,** and **strong alcohol** forms the explosive fulminate of silver or mercury. 32. Dilute nitric acid, while an oxidizing agent, is not as active as the concentrated. It may not give color reactions with some of the alkaloids. 33. Fuming nitric acid is a more active oxidizing agent than the concentrated acid. When it is mixed with **organic matter,** violent explosion or ignition is liable to take place. 34. Nitrates with **sulphuric acid** give nitric acid. 35. Nitrates, particularly those of the fixed alkalies, when triturated with substances capable of being readily oxidized, are liable to explode; some of these substances are **charcoal, phosphorus, sulphur, sugar, sulphides, potassium cyanide, glycerin, alcohol,** and **oils.** 36. Nitric acid when dropped on the skin gives the yellow xanthoproteic acid and a similar reaction takes place with some other organic substances. 37. The nitrates

are all soluble in water; the basic nitrates of bismuth and of mercury are insoluble. Most of the nitrates are rather sparingly soluble in alcohol. [See ACIDA.] (℞ 68–70.)

Acidum Nitrohydrochloricum. — 1. Unless very highly diluted, nitrohydrochloric acid gives a yellow coloration with **strychnine sulphate.** The products formed have not been determined. 2. Nitrohydrochloric acid is a very strong oxidizing agent, and is liable to cause violent reaction when mixed with **organic matter.** 3. It has the oxidizing properties of chlorine and the precipitating properties of hydrochloric acid. [See CHLORUM and ACIDUM HYDROCHLORICUM.] (℞ 71–74.)

Acidum Nitrosum. — 1. Nitrous acid and acid solutions of nitrites, such as potassium or sodium nitrite, amyl nitrite or ethyl nitrite (in spirit of nitrous ether), all act in a similar manner. Sometimes they act as oxidizing and sometimes as reducing agents. In neutral or alkaline mixtures nitrites do not generally oxidize or reduce. 2. The spirit of nitrous ether readily undergoes decomposition, forming alcohol, aldehyde, acetic acid, nitrous acid, nitric acid, and other products. Water tends to hasten and absolute alcohol to prevent decomposition. By neutralizing any free acid with sodium bicarbonate many incompatibilities can be avoided for a time. Sodium bicarbonate is not soluble in alcohol, consequently the spirit will not be made alkaline and any excess can be filtered out. If sodium citrate is allowed to stand in the spirit for some time, the nitrous and nitric acids seem to combine with the sodium and are not then as active oxidizing agents. 3. Ethyl nitrite in the spirit of nitrous ether is decomposed by **alkali hydroxides,** forming alcohol and a nitrite of the alkali. Aldehyde is often present and the alkali gives a yellow to a brown color with this. 4. **Hypophosphites** form phosphoric acid and nitric oxide when mixed with acid solutions of nitrites. 5. **Sulphides** form sulphates and nitric oxide. 6. **Chlorates** form peroxide of chlorine, then hydrochloric and nitric acids. 7. **Iodides** form iodine and nitric oxide. Acetates prevent the liberation of iodine (M. R. XXI. 127). This is true for a time, but later iodine is liberated. 8. **Ammonium bromide** is decomposed by spirit of nitrous ether, liberating bromine. The other bro-

mides are not readily affected. 9. **Mercurous salts** are reduced to metallic mercury. 10. Spirit of nitrous ether after standing with a solution of mercuric chloride causes the formation of a white precipitate which responds to the tests of calomel. 11. **Permanganates** are reduced to manganous salts and nitric acid is formed. 12. **Chromates** are reduced to chromic salts. 13. **Gold chloride** is reduced to metallic gold. 14. **Hydrogen dioxide** oxidizes nitrous acid to nitric. 15. Nitrites with **sulphuric acid** and **alcohol** form ethyl nitrite. 16. Nitrous acid changes **oleic acid** to the isomeric form elaidin. 17. **Antipyrine** with acid solutions of nitrites gives the green isonitroso-antipyrine. [See ANTIPYRINA, No. 17.] 18. **Acetanilid** gives a yellow color with acidulated solutions of nitrites. [See ACETANILIDUM No. 1.] 19. Spirit of nitrous ether with **sodium salicylate** gives a brown red color if allowed to stand for a day or two. 20. **Phenacetin** slowly gives a yellow color which deepens. 21. **Piperazine** gives a yellow to a red solution, with spirit of nitrous ether. 22. **Carbolic acid** with spirit of nitrous ether and water gives a yellow solution at once which begins to assume a red brown color in five minutes and in one half hour is a deep red brown. In a few hours it becomes turbid and deposits a solid. 23. With **tannic** or **gallic acid** or preparations containing them in large amounts, nitrites in acid solution (as an old spirit of nitrous ether) give off gaseous compounds, consisting chiefly of oxides of nitrogen. The reaction may continue for some time, and bottles containing the mixture should not be stoppered until reaction has ceased. 24. With **thymol** spirit of nitrous ether gives a green and then a brown color, changing the thymol to nitroso-thymol. 25. Spirit of nitrous ether produces a yellow color with **morphine.** Morphine is converted into nitroso-morphine, pseudomorphine, and another base (M. & M., III. 436). 26. It gives a red color with aloin. 27. Spirit of nitrous ether with a tincture of **guaiac** gives a blue color which changes to deep red in a few minutes. If the guaiac has been exposed to the light and air for some time the blue color is not produced. 28. With spirit of nitrous ether strong solutions of many salts give an effervescence. [See ACIDUM ACETICUM, No. 6.] 29.

Nitrites are quite soluble in water, except silver, which is only sparingly soluble. [See ACIDA.] (℞ 75–83.)

Acidum Oleicum. — 1. Oleic acid combines slowly with **alkalies** to form soaps. 2. **Nitric acid** oxidizes oleic acid to acetic, propionic, butyric, valeric, adipic, azelaic, and other acids (M. & M., III. 637). 3. **Nitric acid** containing **nitrous acid fumes** or **nitrous acid** converts oleic acid into the isomeric elaidic acid, which is solid. 4. **Potassium permanganate** in alkaline mixtures gives azelaic acid and dioxystearic acids (M. & M., III. 637). 5. Concentrated **sulphuric acid** yields oxystearic acid. 6. **Bromine** and **iodine** combine with oleic acid to form addition products. [See ACIDA.] (℞ 67.)

Acidum Oxalicum. — 1. Oxalic acid and soluble oxalates precipitate as oxalates solutions of many **metallic salts,** such as lead, silver, mercury, copper, barium, calcium, and strontium. With an excess of alkali oxalate double oxalates are sometimes formed. 2. Oxalic acid is quite a strong reducing agent and is oxidized to carbon dioxide by most **oxidizing agents.** 3. A **permanganate** is reduced to a manganous salt. 4. **Potassium chlorate** is reduced to potassium chloride. 5. The metallic oxalates except those of magnesium and the alkalies are generally insoluble in water.

Acidum Phosphoricum. — 1. Free orthophosphoric acid partially precipitates solutions of **silver nitrate** and **lead acetate.** 2. With a solution of **ferric chloride** it forms the colorless ferric phosphate, which is kept in solution by the liberated hydrochloric acid. Tannic acid or preparations containing it do not give the black color when added to this solution of ferric phosphate. 3. Orthophosphoric acid does not coagulate egg **albumin** or **gelatin** (difference from metaphosphoric acid). 4. Phosphoric acid when added to a solution of **soluble phosphate** or **soluble pyrophosphate of iron** produces a white precipitate of ferric phosphate or of pyrophosphate of iron. A large excess of the free acid redissolves the precipitate. 5. The alkali phosphates precipitate neutral solutions of nearly all other common **metals.** The precipitate is a di- or tri-metallic phosphate, and excepting lead, mercurous, **antimony,** and bismuth phosphates, is generally dissolved by phosphoric acid forming mono-metallic salts. 6.

The official sodium phosphate is frequently slightly alkaline and in that condition is apt to precipitate **alkaloids** from solutions of their salts. 7. **Acetic acid** transposes most of the insoluble phosphates, except those of iron, aluminum, and lead. Dilute **nitric, hydrochloric,** and **sulphuric acids** transpose all phosphates. 8. A soft mass is produced when the official sodium phosphate is triturated with quite a number of solids. [See page 270.] 9. The di- and tri-metallic phosphates, except those of the alkalies, are insoluble in water, but many are soluble in a solution of an alkali citrate or an acid. The mono-metallic phosphates are soluble in water to some extent. Phosphates are insoluble in alcohol.

10. Metaphosphoric acid precipitates solutions of **silver nitrate, lead acetate, ferric chloride,** and salts of barium and calcium (difference from orthophosphoric acid). 11. It does not cause a precipitation when it is added to a solution of the **soluble phosphate** or **pyrophosphate of iron.** 12. It coagulates solutions of **egg albumin** or **gelatin.** 13. In aqueous solutions metaphosphoric acid slowly changes to orthophosphoric acid.

14. Pyrophosphoric acid precipitates solutions of **lead acetate, ferric chloride,** and **gelatin.** 15. The pyrophosphates of the alkalies are soluble in water, and precipitate solutions of salts of nearly all other **metals.** 16. Most of the pyrophosphates are soluble in solutions of alkali pyrophosphates as double salts. Alkali citrates also have a solvent effect. [See ACIDA.] (℞ 84–89.)

Acidum Picricum. — 1. Picric acid and picrates precipitate **albumin, gelatin,** and most **alkaloids** from aqueous solutions of their salts. 2. Salts of picric acid explode when struck or strongly heated (Richter, II. 151). 3. It is explosive when rubbed or heated with readily oxidizable substances such as sulphur. [See ACIDA.]

Acidum Salicylicum. — 1. Salicylic acid unites with **alkali hydroxides** and with many **metallic oxides** to form salts. 2. Salicylic acid liberates carbon dioxide from **carbonates.** 3. Solutions of the salicylates in water, particularly if alkaline, become colored red brown on exposure to the **air.** This can be

prevented by the addition of a small proportion of sodium thiosulphate. 4. Sodium salicylate precipitates solutions of **lead acetate** and **silver nitrate** as salicylates. 5. Salicylic acid and soluble salicylates with dilute solutions of **ferric salts** give a blue violet to a violet red color, depending upon the concentration. In rather acid solutions the color varies from that of the iron to brown or red. The color is destroyed by a large excess of a mineral acid or acetic acid. In nearly neutral solutions a precipitate of basic ferric salicylate is formed. 6. Sodium salicylate with **copper sulphate** gives a green solution from which the copper is not precipitated in dilute solutions by alkali hydroxides. 7. **Lime water** gives a precipitate when mixed with a concentrated solution of sodium salicylate. 8. With **bismuth subnitrate** sodium salicylate in aqueous solution is said to give several compounds of bismuth and salicylic acid which have a color varying from white to red orange. The coloration, according to the author's experience, is not noticeable except after the lapse of considerable time, and may then be due to oxidation products of salicylic acid. 9. A solution of **potassium iodide** with salicylic acid becomes yellow in one day, and after a few days it is brown and gives a test for iodine. 10. Concentrated **nitric acid** with salicylic acid gives nitrosalicylic acid. 11. **Potassium chlorate** with hydrochloric acid converts salicylic acid into tetrachloroquinone (N. S. D.). **Chlorine** forms mono- and di-chlorosalicylic acid (M. & M., III. 680). 12. A solution of **iodine** is slowly decolorized by sodium salicylate. Iodine gives mono-, di-, and tri-iodo-salicylic acid and tri-iodo-phenol (M. & M., III. 680). 13. **Bromine water** gives a precipitate with dilute solutions of salicylates. 14. **Potassium permanganate** oxidizes salicylic acid to formic acid and carbon dioxide. 15. Sodium salicylate with **spirit of nitrous ether** gives a yellow solution which changes to red brown in a few hours. 16. A mixture varying from a damp powder to a liquid results when salicylic acid or sodium salicylate is rubbed with **exalgin, lead acetate, sodium phosphate,** or **urethane.** In case of lead acetate there is a strong odor of acetic acid, indicating that acetic acid is liberated. 17. Salicylic acid is said to give a soft mass when it is rubbed with **antipyrine,** but

according to the author's experiments this is not the case. 18. Sodium salicylate rubbed with **antipyrine** gives a powder which becomes damp and sticky. Some say that this is due to absorption of moisture from the air, while others say that chemical reaction takes place. 19. Soluble salicylates with solutions of **quinine sulphate** give a white curdy precipitate of quinine salicylate which is nearly insoluble in water. Sodium salicylate with a dilute solution (1 : 1000) of quinine sulphate gives a crystalline precipitate in a few days. 20. **Mineral acids** and some **organic acids** liberate salicylic acid from solutions of the salicylates. Salicylic acid, being but slightly soluble, is precipitated from a not too dilute aqueous solution. 21. A concentrated aqueous solution of sodium salicylate (1 : 1) is a good solvent for **volatile oils, resinous substances, carbolic acid, guaiacol, creosote, thymol, menthol,** and other bodies. More or less water can be added to these solutions without precipitation. 22. Sodium salicylate tends to prevent precipitation of some of the metallic oxides or hydroxides. 23. Salicylic acid is rendered more soluble in water by the presence of **borax.** The compound $C_{14}H_{10}NaBO_7$ is said to be formed and deposited in the form of crystals from strong solutions, and also that the liquid soon undergoes decomposition, acquiring a bitter taste (N. S. D.). 24. Salicylic acid is rendered more soluble in water by the presence of several neutral salts, such as the citrates, acetates, and phosphates of the alkalies, by potassium nitrate, and by sodium sulphite. Excepting mercuric and bismuth salicylates, they are generally soluble in alcohol. [See Acida.] (℞ 90–99.)

Acidum Stearicum. — 1. Stearic acid combines with the **alkali hydroxides** and **carbonates** to form stearates. 2. **Nitric acid** oxidizes it to succinic and other acids (M. & M., IV. 512). 3. **Bromine water** forms mono- and di-bromostearic acid (M. & M., IV. 513).

Acidum Sulphuricum. — 1. Sulphuric acid transposes the **salts** of nearly all other acids. 2. Sulphuric acid and the soluble sulphates precipitate as sulphates solutions of salts of **lead, barium, calcium** (in concentrated solution), and **strontium.** The addition of potassium tartrate dissolves some of the precipitates.

3. Sulphuric acid dissolves many **metals** with the evolution of hydrogen or sulphur dioxide, depending on the concentration of the acid. 4. With **hypophosphorous acid** it forms sulphurous acid and then sulphur. 5. **Hydriodic acid** with concentrated sulphuric acid forms iodine and sulphurous acid. Dilute acid liberates hydriodic acid from iodides. 6. Concentrated sulphuric acid causes detonation with **chlorates,** with the evolution of the greenish yellow chlorine peroxide. 7. With **alcohol** sulphuric acid forms ethylsulphuric acid and then ether. 8. **Water** precipitates the aromatics from the aromatic sulphuric acid. 9. The concentrated acid with most **organic matter** forms a black mass, due to the extraction of the elements of water, leaving carbon. Some organic acids, many alkaloids, and some other compounds are not thus affected. 10. Dilute sulphuric acid does not cause as many decompositions as the concentrated. 11. The sulphates of lead, barium, strontium, and calcium are nearly insoluble in water; silver and mercurous sulphates are sparingly soluble; mercuric, antimony, and bismuth are soluble in acidulated water; the others are soluble in water. Sulphates are generally insoluble in alcohol. [See ACIDA.] (℞ 100–104.)

Acidum Sulphurosum. — 1. Sulphurous acid on exposure to **air** is slowly oxidized to sulphuric acid. 2. Sulphurous acid does not usually precipitate solutions of metallic salts. The soluble sulphites — potassium, sodium, and ammonium — precipitate neutral solutions of salts of nearly all other **metals.** Sometimes sulphurous acid contains sulphuric acid which may cause reaction in certain cases. 3. Sulphites and sulphurous acid give a red color with a dilute solution of **ferric chloride.** The color is soon destroyed, due to the change of the ferric sulphite to ferrous sulphate. 4. **Nitric** or **nitrous acid** oxidizes sulphites to sulphates. 5. **Hypophosphites** in acid solution with sulphites form phosphoric acid and sulphur. 6. Sulphites with **chlorine,** or **chlorates** in acid solution, produce sulphuric and hydrochloric acids. 7. **Silver salts** in solution are first precipitated by sulphites and then reduced to metallic silver when warmed. 8. **Arsenic compounds** are reduced to arsenous. 9. **Permanganates in** acid solution are reduced by sulphites to manganous compounds.

10. **Chromates** in acid solution are reduced to chromic salts. 11. **Mercuric** and **mercurous nitrates** are reduced to metallic mercury. **Mercuric chloride** is slowly reduced to calomel and on heating to metallic mercury; the sulphurous acid acts more quickly than the sulphites. 12. Sulphurous acid has a bleaching effect on organic **coloring matters.** 13. Sulphites are decomposed by nearly all **acids,** except carbonic, boric, hydrocyanic, and in some instances hydrosulphuric. 14. The sulphites of the alkali metals are soluble in water; the sulphites of the alkaline earths are soluble in sulphurous acid; the others are insoluble or sparingly so. The sulphites are insoluble in alcohol. [See ACIDA.] (℞ 105–108.)

Acidum Tannicum. — 1. An aqueous solution of tannic acid changes, forming gallic acid and probably some elagic and carbonic acids. The change is retarded or prevented by the presence of glycerin or alcohol. The solution gets darker on standing and this is hastened by alkalies. 2. Tannic acid in dilute solutions combines with the **alkali hydroxides** and **carbonates** to form soluble tannates and these solutions soon become colored, varying from red to brown, green, or black. 3. **Potassium hydroxide** or **carbonate** with a concentrated solution of tannic acid gives a compound which is but slightly soluble in water, but dissolves in a certain excess of alkali. When potassium hydroxide is added in excess to a solution of tannic acid, tannoxylic acid or rubitannic acid is formed; if the mixture is boiled tannomelanic acid is formed (A. D., 95). 4. **Ammonia** in its reactions resembles potassium hydroxide but the precipitate is not nearly so great unless ammonium chloride has been previously added to the ammonia. 5. **Sodium hydroxide** gives little or no precipitate. 6. A small amount of **lime water** added to a solution of tannic acid gives a precipitate which redissolves; adding more lime water the precipitate is white and permanent, changing to light blue and then dark blue as more lime water is added; a very large excess of lime water gives a precipitate which is pinkish. 7. Tannic acid precipitates as tannates solutions of salts of many of the metals, especially **lead, silver, mercury, copper, bismuth,** and **antimony.** 8. The alkali tannates give

precipitates with solutions of salts of nearly all other **metals.** 9. With solutions of **ferric salts** tannic acid gives a solution or precipitate (depending on the concentration and acidity) of a dark blue black to green black color. The addition of enough of phosphoric acid to convert the iron into ferric phosphate prevents or destroys the color. Theoretically forty-eight minims of ten per cent phosphoric acid is sufficient to convert one dram of the official tincture of ferric chloride into the phosphate. Practically it requires from one and a half to two times as much dilute acid as tincture, depending to some extent upon the amount of tannic acid, to prevent the formation of the dark tannate of iron. 10. With purely **ferrous salts** in concentrated solution (not in dilute solution) it gives a white gelatinous precipitate, which quickly becomes blue on exposure to air. Nearly all commercial samples of ferrous sulphate contain some ferric salt. 11. A strong solution of tannic acid gives precipitates with concentrated **sulphuric, hydrochloric,** or **phosphoric acids.** These precipitates are supposed to be compounds of tannic acid with the respective acids, and are soluble in pure water but not in acidulated water (U. S. D.). 12. Saturated solutions of **sodium chloride, calcium chloride, potassium acetate,** and some other **salts** precipitate tannic acid from strong solutions. Precipitated by mineral salts or acids, tannic acid loses its astringency (Br. P., 21). 13. **Potassium bichromate** gives precipitates with most tannins (M. & M., IV. 634). 14. **Potassium cyanide** gives a green coloration with a solution of tannic acid (M. & M., IV. 634). 15. With tannic acid and water **iodine** forms hydriodic acid, which combines with part of the tannic acid and remains in solution; the oxygen of the decomposed water combines with tannic acid and forms an insoluble compound; the solution is capable of dissolving iodine; the iodine in a liquid containing an excess of tannic acid does not give a blue color with starch (U. S. D., 19th ed. 81). 16. **Nitric acid, chromic acid, chlorine,** or **bromine** oxidizes tannic acid to formic and oxalic acids (A.D., 95). 17. Tannic acid reduces **potassium permanganate.** 18. Tannic acid with **Fowler's solution** or a solution of **sodium arsenate** gives a nearly white precipitate which with the liquid turns to a dark dirty green within

a day. 19. **Hydrogen dioxide water** with tannic acid shows no change at first but after a few days a light brown precipitate falls. 20. Tannic acid reduces salts of **gold, silver, mercury,** and **copper** (Allen, III. part I. 35). 21. Triturated with **potassium chlorate** or other substances which yield their oxygen readily, tannic acid is liable to cause an explosion. 22. With **spirit of nitrous ether, amyl nitrite,** or **nitrous acid** tannic acid causes a decomposition and the formation of gaseous compounds some of which are oxides of nitrogen. The solution becomes deep red. 23. Tannic acid gives precipitates with solutions of **albumin, gelatin, glutin,** or **starch.** 24. It precipitates as tannates nearly all **alkaloids** from aqueous or dilute alcoholic solutions of their salts; the precipitate is generally soluble in mixtures containing over fifteen to forty per cent alcohol. The presence of some organic acids, acacia, or starch also tends to prevent the precipitation. 25. Tannic acid precipitates some **glucosides, neutral** and **bitter principles.** 26. It precipitates aqueous solutions of **antipyrine.** 27. Tannic acid slowly decomposes **iodoform** (U. S. D.). 28. All drugs containing tannic acid in large proportions will have the incompatibilities given above. Some of the drugs which contain notable quantities of tannic acid are catechu, kino, krameria, logwood, geranium, blackberry-root bark, and oak bark. [See ACIDA.] (℞ 109–117.)

29. Tannalbin or albumin tannate is practically insoluble in water or alcohol. Alkaline liquids dissolve it slowly, breaking it up into its constituents. 30. Tannigen or diacetyl tannin is practically insoluble in water but soluble in alcohol. Solutions of borax, sodium phosphate, sodium carbonate, and lime dissolve it, from which solutions, acids reprecipitate it. Solutions of sodium or potassium hydroxides slowly break it up into acetic and gallic acids, while ammonia water breaks it into acetic and tannic acids. In aqueous solution it gives a green color with ferric chloride. 31. Tannismuth or bismuth bitannate is nearly insoluble in water but soluble in cold caustic alkalies. In the body it is probably broken up into its constituents. 32. Tannoform or tanninformaldehyde is nearly insoluble in water but soluble in alcohol and alkalies and has many of the incompatibili-

ties of tannic acid. 33. Tannopin or hexamethyleneamine tannin is insoluble in water, weak acids, chloroform, or ether, but is slowly soluble in weak alkalies. Heating with weak acids, it gives off formaldehyde, or heating with sodium hydroxide, ammonia is given off.

Acidum Tartaricum. — 1. When tartaric acid is added in excess to a rather strong solution of **potassium hydroxide** or many of its salts, a crystalline precipitate of potassium bitartrate forms. 2. When tartaric acid is associated with **boric acid** it is not precipitated by potassium hydroxide, even on adding acetic or hydrochloric acid (U. S. D.). Boric combines with tartaric acid to make borotartaric acid which is a stronger acid than boric. 3. Tartaric acid in excess with a strong solution of **ammonia** gives a precipitate of ammonium bitartrate. 4. Potassium tartrate or Rochelle salt gives a precipitate of potassium bitartrate on adding many **acids,** the precipitate dissolving in a large excess of a mineral acid. 5. The soluble tartrates precipitate as tartrates neutral solutions of salts of most **metals.** The precipitate is generally soluble in tartaric acid or mineral acids. Many of the tartrates form soluble compounds with the alkali hydroxides, due to the formation of double tartrates. 6. Tartaric acid decomposes **potassium iodide,** forming a tartrate and hydriodic acid which is slowly decomposed by the air, liberating iodine. 7. Under certain conditions tartrates reduce salts of **gold, silver,** and **platinum; mercuric chloride** becomes mercurous chloride. 8. **Potassium permanganate** with an alkaline solution of a tartrate is reduced to manganese dioxide, while the tartaric acid is converted into formic acid, carbon dioxide, and water; free tartaric acid is acted upon but slowly. 9. **Chromates** oxidize tartaric acid to formic acid, carbon dioxide, and water (M. & M., IV. 642). 10. Tartaric acid and tartrates tend to prevent the precipitation by alkali hydroxides of the oxides and hydroxides of the **metals** aluminum, antimony, bismuth, nickel, calcium, cobalt, chromium, copper, iron, lead, and zinc. 11. Tartrates in aqueous solutions have more or less solvent effect on certain salts which ordinarily are insoluble, as calcium phosphate, lead sulphate, and barium sulphate. 12. Tartrates are transposed by mineral **acids.**

13. Tartrates of the alkali bases are soluble in water. The bitartrates of potassium and ammonium are sparingly soluble. The manganous and ferric tartrates are soluble; calcium tartrate, sparingly soluble. The other tartrates are nearly insoluble. Tartrates are generally insoluble in alcohol. [See ACIDA.]

Acidum Trichloraceticum. — 1. Trichloracetic acid precipitates solutions of **albumin.** 2. It is decomposed when heated with **alkalies** and **carbonates,** forming carbon dioxide and chloroform.

Aconitina. — 1. Aqueou solutions of salts of aconitine are precipitated by **alkali hydroxides,** the **carbonates** of the fixed alkalies, and by the **general alkaloidal reagents,** but not by ammonium carbonate or the bicarbonates. 2. Aconitine is decomposed by long standing or by heating with **acids, alkalies,** or **water,** forming benzoic acid, acetic acid, and aconine. 3. The colors produced by reagents are generally due to impurities rather than to aconitine. [See under ALKALOIDS.] (℞ 118.)

Adeps. — 1. Lard oxidizes on exposure to **air** and **light,** becoming acid and rancid, and in this condition liberates iodine from potassium iodide. 2. Lard is decomposed by **alkali hydroxides** or **carbonates,** forming glycerin, and oleates, stearates, and palmitates of the alkalies. Commercial lard sometimes contains alkalies or alkaline carbonates in small amounts, and consequently has the incompatibilities of these. [See Acidum Oleicum and Acidum Stearicum.] (℞ 132.)

Æther. — 1. In partly filled bottles, particularly in the presence of **water,** ether becomes acid, due to the formation of acetic acid. 2. Ether in the light is said to tend to produce hydrogen dioxide (M. R. XVIII, 228). 3. Ether with **bromine** forms ethyl bromide, bromal, and other products after a few days. 4. Hot **nitric acid** forms carbon dioxide, acetic and oxalic acids. 5. **Chromic acid** oxidizes it to acetic acid (M. & M., II. 465).

Æther Aceticus. — 1. Ethyl acetate in the presence of **moisture** decomposes into alcohol and acetic acid. 2. With **alkaline hydroxides** it yields alcohol and an acetate of the alkali. 3. It forms chlorinated compounds with **chlorine.** 4. With **lime water and chlorinated lime** it yields chloroform.

Æthylis Bromidum. — 1. Ethyl bromide is quickly decomposed by light and air, forming alcohol, hydrobromic acid, and some free bromine. The presence of one per cent of alcohol or three per cent of ether makes it more stable. 2. With **alkali hydrates** it gives ether and potassium bromide (M. & M., 480). 3. Ethyl bromide with **ammonia** gives hydrobromate of ethylamine (Watts, II. 528).

Æthylis Carbamas, *Urethane.* — 1. Urethane in the presence of **iodine** and an **alkali hydroxide** or **carbonate** produces iodoform. 2. Warming it with a solution of **potassium hydroxide** causes ammonia to be given off (U. S. P., 33). With an alcoholic solution of potassium hydroxide it gives large crystals of potassium cyanate (M. &. M., I. 679). 3. When rubbed with **benzoic acid** or some other solids urethane gives a liquid or soft mass. [See page 270.]

Æthylis Iodidum. — 1. Ethyl iodide or hydriodic ether on being exposed to **air** and **light** is decomposed with liberation of iodine. 2. Iodine is liberated by **chlorine, nitric acid,** and **sulphuric acid.** 3. **Silver nitrate** gives a precipitate of silver iodide (M. & M., II. 499).

Æthylmorphinæ Hydrochloridum, *Dionin.* — 1. **Alkalies** and their **carbonates** precipitate the free ethylmorphine. 2. It is precipitated by most of the general **alkaloidal reagents.** 3. It is not as strong a reducing agent as morphine and does not give as many color reactions.

Albumin. — 1. The coagulation of the different albumins varies. 2. Aqueous solutions of egg albumin are coagulated by **heat** and by many **mineral acids, as hydrochloric, nitric,** and **meta-phosphoric** (not by ortho- or pyro-phosphoric acid); 3. by salts of many heavy metals, as **mercuric chloride** (prevented to a considerable extent by the presence of ammonium or sodium chloride or hydrochloric acid), **alum, copper sulphate, silver nitrate, gold chloride,** and **ferric chloride**; 4. by some neutral salts, as **ammonium sulphate**; 5. by **hydrogen dioxide water**; 6. by some organic acids, as **tannic acid** and substances containing **it** (not by gallic acid), **lactic acid, picric acid, carbolic acid, creosote, acetic** and **trichloracetic acids**; 7. by some organic com-

pounds, as **alcohol** (the precipitate is redissolved by dilution with water if the albumin has not been in contact with the alcohol too long), **formaldehyde, ether, collodion, resorcin, camphor, thymol, sozoidol, volatile oils,** and **coniine** (not nicotine). (℞ 120.)

Alcohol. — 1. Alcohol precipitates albumin, acacia, and many **inorganic salts** from their aqueous solutions; to precipitate the acacia the resulting mixture must contain about thirty or forty per cent alcohol before a permanent precipitate results. 2. Strong **nitric acid** (not dilute) acts violently on alcohol, forming nitric oxide, nitrous ether, carbon dioxide, aldehyde, acetic and formic acids (M. & M., I. 97). 3. **Chromic acid** or a **chromate** in an acid solution oxidizes alcohol to aldehyde and acetic acid. 4. **Potassium permanganate** in acid (not in alkaline) solution oxidizes it to aldehyde and acetic acid. 5. **Chlorine** is rapidly absorbed by alcohol and in sunlight may ignite the alcohol. The ultimate product is chloral alcoholate, there being a number of intermediate products, such as hydrochloric acid, aldehyde, ethyl chloride, acetic acid, chloral, etc. (M. & M., I. 97). 6. **Bromine** forms hydrobromic acid, water, ethyl bromide, bromal and bromal alcoholate (M. & M., I. 97). 7. **Mercuric chloride** is slowly reduced to calomel by alcohol (M. & M., I. 98). 8. **Nitric acid** with the nitrate of **mercury** or **silver** and strong alcohol forms the explosive fulminate of mercury or silver (M. & M., I. 97). 9. Concentrated **mineral acids** convert alcohol into esters and ethers. 10. Alcohol combines with many **metallic salts,** acting like water of crystallization (M. & M., I. 98). 11. With **chloral hydrate** alcohol forms chloral alcoholate which is not very soluble in elixir and less so in the presence of potassium bromide. 12. Alcohol sometimes contains traces of aldehyde or other impurities which are darkened by **alkali hydroxides.** 13. The official alcoholic preparations, except those mentioned in the following classes, give precipitates when mixed with **water,** the precipitate sometimes being the active principle and sometimes inert matter: tinctures, except chloride of iron, iodine, and deodorized tincture of opium; fluidextracts, except cascara, aromatic cascara, and glycyrrhiza; spirits, except nitrous ether. 14. **Water** generally causes a precipitation, when mixed with alcoholic

solutions of the following substances: free alkaloids, alkaloids combined with any of the general alkaloidal reagents, glucosides, neutral and bitter principles, salicylic, gallic, or benzoic acid, volatile oils, resins, camphors, oleoresins, or balsams. 15. Among the many substances which alcohol generally dissolves may be mentioned acetates (except mercurous and silver), benzoates, bromides, chlorides (except potassium, sodium, ammonium, lead, silver, and mercurous), iodides (except lead, silver, and mercurous), nitrates (except potassium, lead, and bismuth), salicylates (except mercury and bismuth), deliquescent salts (except potassium carbonate), acids, alkali hydroxides, alkali hypophosphites, phosphorus, sulphur, iodine, organic and inorganic acids, hydrocarbons and carbon derivatives, volatile oils, phenols, camphors, resins [see under RESINÆ], oleoresins, balsams, alkaloids and their salts, glucosides, and neutral principles. 16. Inorganic substances that are insoluble in water are also generally insoluble in alcohol. (℞ 121.)

Alkalies. — The following preparations contain an alkali hydroxide or carbonate: ammonia water, stronger ammonia water, fluidextracts of glycyrrhiza and senega, ammonia liniment, lime liniment, lime water, compound cresol solution, solution of lead subacetate, solution of potassium hydroxide, solution of sodium hydroxide, solution of potassium arsenite, bismuth magma, magnesia magma, aromatic spirit of ammonia, ammoniated tincture of guaiac, ammoniated tincture of valerian, syrup of rhubarb, and aromatic syrup of rhubarb. [See AQUA AMMONIÆ AND LIQUOR POTASSII HYDROXIDI.]

Alkaloids. — 1. Alkaloids combine with **mineral acids** and **acetic** and **citric acids** to form salts which are generally soluble in water or alcohol, but insoluble in ether, chloroform, benzol, petroleum ether, carbon bisulphide, or oils. In combination with most other **organic acids** the alkaloids form salts that are not generally soluble in water. 2. Alkaloids combined with acids and dissolved in water or very dilute alcohol are generally precipitated as free alkaloids by solution of **alkali hydroxides** or **carbonates** and by **borax.** Solutions of **lead subacetate, potassium arsenite, sodium phosphate,** and **sodium arsenate** are

slightly alkaline and may precipitate the free alkaloid. Practically all agents whose reaction to litmus is alkaline, whatever be their chemical function, precipitate the alkaloids from their salts. **Ammonium carbonate** and the **bicarbonates** of **potassium** and **sodium** frequently do not cause precipitation. 3. The alkaloidal salts are generally precipitated from aqueous solution, combined with the precipitant, by soluble **salicylates, benzoates, bichromates, iodides, bromides,** and by the following general alkaloidal reagents: **tannic acid, picric acid, iodine** in solution of potassium iodide, **bromine** in solution of potassium bromide, **potassium mercuric iodide** (Mayer's reagent), **potassium bismuthic iodide, mercuric chloride, platinic chloride, gold chloride,** and **phosphomolybdic acid.** The presence of from twenty to fifty per cent of alcohol will nearly always prevent the precipitation. 4. A solution of a mixture of **boric** and **salicylic acids** gives a precipitate with solutions of many alkaloidal salts as boro-salicylates. [See ACIDUM BORICUM, No. 19.] 5. In the presence of acacia some alkaloids are not precipitated from dilute aqueous solutions of their salts by tannic acid, potassium mercuric iodide, or sodium phosphomolybdate (Allen, I. 426). **Starch** dissolved by boiling in water has a similar effect with the potassium mercuric iodide. 6. Some alkaloidal salts are thrown out of solution by the presence of considerable quantities of very **soluble salts,** e.g., strychnine hydriodide by potassium iodide. 7. Some alkaloids are strong reducing agents, most alkaloids are decomposed by **oxidizing agents.** 8. The free alkaloids are generally only sparingly soluble in water, except atropine, caffeine, codeine, nicotine, and coniine, but are generally soluble in alcohol, ether, or chloroform. A few are soluble in excess of solutions of fixed alkali hydrates, e.g., morphine; a few are soluble in excess of ammonia water, e.g., quinine. 9. A strong solution of **chloral hydrate** dissolves morphine, quinine, and many other alkaloids. The solubility of the salts of the alkaloids is also increased. Dilution with water may cause a precipitation of the alkaloid.

Aloinum. — 1. Concentrated solutions of aloin are slowly precipitated by a solution of **lead subacetate** (not the neutral lead acetate), more quickly if the mixture is heated. The

liquid is turned brown. 2. An aqueous solution of aloin with **ferric chloride** gives a green black to a brown black color. 3. With solutions of **alkali hydroxides** aloin gives an orange to a red color, is readily decomposed, and rendered inert. 4. Concentrated **nitric acid** gives a red color with barbaloïn (not with nataloin or socaloin), and by further action chrysammic, picric, and oxalic acids are formed. 5. **Gold chloride** gives a carmine red, changing to violet. 6. **Spirit of nitrous ether** gives a red solution with aloin, even in the presence of a large amount of water. 7. A red color is produced more or less quickly when one tenth of a grain of any of the following **alkaloids** in a dram of alcohol is added to a sixth of a grain of aloin in water, strychnine, quinine, morphine, cocaine, codeine, heroine, or hydrastine. Sometimes a violet tinge is produced which is slowly dissipated. The salts of these alkaloids, except quinine, give little or no color (Bul. Pharm., XIX. 294). The coloration may be caused by the alkalinity of these alkaloids. (℞ 122.)

Alumen. — 1. Alum in solution is precipitated as aluminum hydroxide by the **alkali hydroxides** and their **carbonates, borax,** and **lime water,** soluble in excess of potassium or sodium hydroxide. Citrates, tartrates, glycerin, sugar, and acacia tend to prevent precipitation. 2. The **alkali phosphates** give the insoluble aluminum phosphate. Citrates and tartrates tend to prevent precipitation. 3. With **tartaric acid** it gives a precipitate of potassium bitartrate. 4. **Tannic acid** or its preparations causes a slight precipitation. 5. Alum is slightly acid to litmus. 6. Adding a **soluble carbonate** to a solution of alum produces an effervescence, due to the liberation of carbon dioxide, aluminum hydroxide being precipitated. 7. Alum has the incompatibilities of the soluble sulphates. 8. The hydroxide, arsenate, borate, oxalate, and phosphate are insoluble in water. [See ACIDUM SULPHURICUM.] (℞ 123.)

Alumini Hydroxidum. Aluminum hydroxide, especially when freshly precipitated, removes suspended solid matter, alkaloids and coloring matter in solution from liquids.

Alumini Naphtholsulphonas, *Alumnol.* 1. Alumnol gives an acid solution in alcohol or water, and the dilute solution has a

blue fluorescence. The fluorescence is destroyed by resorcin. 2. The aqueous solution gives a precipitate of aluminum hydroxide when an **alkali hydroxide** is added. The precipitate redissolves in an excess of a fixed alkali. 3. The **alkali carbonates** give a white precipitate. 4. With a solution of **ferric chloride** alumnol gives a deep blue color. 5. **Silver nitrate** is not precipitated at once but is slowly decomposed and precipitated as metallic silver. 6. **Nitric acid** gives a yellow to a red color. 7. It is precipitated by a solution of **albumin** or **gelatin,** the precipitate being soluble in excess of these substances. 8. Rubbed with **carbolic acid** it gives a mass. 9. It should not be given with reducible substances. (℞ 124.)

Alypin. — 1. An **alkali hydroxide** or **carbonate** gives a precipitate with an aqueous solution of alypin. 2. It is precipitated by many **alkaloidal reagents.** 3. Mixed with **calomel** and dampened with alcohol it gives a black color.

Ammonii Carbonas. — 1. Ammonium carbonate with **calomel** gives a black mixture of mercuric ammonium chloride, having the formula NH_2HgCl, with some metallic mercury (P. & J., 39). 2. With a solution of **mercuric chloride** it gives a white precipitate of ammoniated mercury, NH_2HgCl. 3. It gives no precipitate with **magnesium salts,** except in concentrated solutions. 4. The precipitate with **copper** or **silver** salts is dissolved by an excess of the carbonate. 5. Ammonium carbonate does not precipitate as many of the **alkaloids** from solutions of their salts as do the carbonates of potassium and sodium. Some of the alkaloids not precipitated are atropine, hyoscyamine (except in strong solution), nicotine, coniine, codeine, and caffeine. 6. Ammonium carbonate with **resorcin** in solution gives a red brown solution at first which changes to deep blue in a day or two. 7. Excepting the reactions noted above, ammonium carbonate generally acts similarly to potassium or sodium carbonate. [See CARBONATES AND AMMONIUM.] (℞ 125–128.)

Ammonii Chloridum. — 1. An aqueous solution is decomposed by **chlorine,** forming hydrochloric acid and the explosive nitrogen chloride (M. & M., I. 202). 2. Ammonium chloride aids the solution of several salts that are more or less insoluble ordi-

narily, and sometimes renders other salts less soluble. [See ACIDUM HYDROCHLORICUM and AMMONIUM.]

Ammonii Iodidum. — 1. Ammonium iodide very frequently contains free iodine, and it would then have the incompatibilities of iodine. [See IODUM, ACIDUM HYDRIODICUM, and AMMONIUM.]

Ammonii Valeras. — Ammonium valerate in concentrated aqueous solution with **mineral acids** gives an oily layer of valeric acid. [See AMMONIUM.]

Ammonium. — 1. Ammonium compounds, with solutions of the **fixed alkali hydroxides** or **carbonates,** or with the **hydroxides** of **barium, calcium,** or **strontium,** give free ammonia. 2. Some ammonium salts with **chlorine gas** give explosive nitrogen chloride. 3. Certain ammonium salts, such as the acetate, citrate, and chloride, in aqueous solution may act as solvents for otherwise insoluble compounds. 4. Some ammonium salts are easily decomposed in the air as the iodide and carbonate. 5. The bitartrate is sparingly soluble but the other common salts are readily soluble. [See AQUA AMMONIÆ.]

Amylis Nitris. — 1. Amyl nitrite is decomposed slowly by **light** and **air,** becoming acid. 2. With **potassium hydroxide** it forms potassium nitrite and amyl alcohol (Allen, I. 212). 3. Its incompatibilities are about the same as those of spirit of nitrous ether. [See ACIDUM NITROSUM.] (℞ 129.)

Amylum. — 1. Starch in aqueous solution is precipitated by **strong alcohol, tannic acid,** or **lead subacetate.** 2. **Iodine** with starch forms the blue black iodide of starch. 3. With solutions containing over five per cent of an **alkali hydroxide** starch forms a soluble compound. 4. Heating with dilute **acids,** starch is changed to dextrin and then dextrose. Diastase changes it chiefly to maltose. 5. In solution starch to some extent prevents the precipitation of **alkaloids** by potassium mercuric iodide and tannic acid. (℞ 130.)

Antimonii et Potassii Tartras. — 1. Tartar emetic in aqueous solution is precipitated by **hydrochloric, nitric,** or **sulphuric acid,** forming a basic chloride, nitrate, or sulphate of antimony, together with some potassium bitartrate. Tartaric acid prevents this precipitation to some extent. 2. The **alkali hydroxides**

or their **carbonates,** with solutions not too dilute, give a white precipitate of antimony oxide. Citrates, tartrates, glycerin, sugar, and acacia prevent precipitation. 3. **Lime water** throws down a precipitate consisting of the mixed tartrates of calcium and antimony. 4. The salts of most **metals,** being precipitated by normal tartrates, are incompatible with tartar emetic. 5. Strong **alcohol** throws tartar emetic out of aqueous solution. 6. **Tannic acid** gives a precipitate of tannate of antimony. 7. **Gallic acid** precipitates concentrated solutions of tartar emetic. 8. In aqueous solution **mercuric chloride** is reduced to calomel which is precipitated. 9. Solutions of **lead acetate, silver nitrate, albumin,** and **soap** give precipitates with tartar emetic. 10. Excepting the acetate and tartrate, the salts of antimony are not soluble in water but are in strongly acid solutions. (℞ 131.)

Antimonii Sulphidum. — 1. Triturated with a strong **oxidizing agent,** as potassium chlorate, sulphide of antimony may cause an explosion. 2. By exposure to **air** it is partially converted into an oxide.

Antipyrina, *Analgesin, Phenazone.* — 1. Antipyrine is neutral to litmus, but forms salts with **acids** by direct addition. 2. An aqueous solution with a strong solution of **sodium hydroxide** gives a white precipitate. 3. With a solution or tincture of **ferric chloride** antipyrine gives a red color. This color is destroyed or prevented by an excess of mineral acids. With tincture citrochloride of iron the red color is not formed, but on adding a dilute mineral acid to this it is produced at once. 4. With commercial **ferrous sulphate** it gives a red color, due to the ferric salt which is present. With strictly ferrous salt the solution is colorless. 5. A mixture of two drams of antipyrine with one ounce of simple syrup and one ounce of **syrup of ferrous iodide** (free from iodine) soon gives a red liquid and after a time red crystalline precipitate. 6. Antipyrine gives a green color with a solution of **copper sulphate.** 7. With a strong solution of antipyrine **lead subacetate** forms a precipitate. 8. In the presence of moisture **calomel** is slowly turned dark by antipyrine, but if sodium bicarbonate is mixed with it the color is changed at once. Experiments made in the laboratory of the American Medical Associa-

narily, and sometimes renders other salts les ... erted into
ACIDUM HYDROCHLORICUM and AMMONIUM.] ... ntipyrine is
Ammonii Iodidum. — 1. Ammonium iodid ... acid or by
contains free iodine, and it would then have th ... are both said
of iodine. [See IODUM, ACIDUM HYDRIODICU ... g these with
Ammonii Valeras. — Ammonium valera ... s no apparent
aqueous solution with **mineral acids** gives a ... **nitric acid** gives
acid. [See AMMONIUM.] ... 12. A solution
Ammonium. — 1. Ammonium compou ... red brown pre-
the **fixed alkali hydroxides** or **carbonates**, ... yrine, forming a
of **barium, calcium,** or **strontium,** give ... the colorless iodo-
ammonium salts with **chlorine gas** g ... e. If more iodine
chloride. 3. Certain ammonium salt ... which is soluble in
citrate, and chloride, in aqueous soluti ... ate which is soluble
otherwise insoluble compounds. 4. S ... g more bromine. 14.
easily decomposed in the air as the ... of chlorinated soda is
The bitartrate is sparingly soluble ... nd a precipitate may
are readily soluble. [See AQUA AM ... olored yellow to red.
Amylis Nitris. — 1. Amyl nitr ... **ssium permanganate,** pre-
light and **air,** becoming acid. 2. ... **romic acid** gives an orange
forms potassium nitrite and amyl ... **pyrine.** 17. An aqueous
incompatibilities are about the sa ... pitate **with tannic acid** or
ether. [See ACIDUM NITROSUM.] ... erable proportions, by **picric**
Amylum. — 1. Starch in a ... **oidal reagents.** [See under
by **strong alcohol, tannic acid** ... ng aqueous solution is pre-
with starch forms the blue b ... re of **boric** and salicylic acids,
solutions containing over five ... 19. **Spirit of nitrous ether**
starch forms a soluble compo ... ution, and on standing green
starch is changed to dextr ... is concentrated. The reaction
changes it chiefly to malto ... en the spirit is neutral as when
extent prevents the preci ... the sodium bicarbonate present the
mercuric iodide and tannic ... of several days or weeks. The green
Antimonii et Potassii T ... pyrine. The experiments of Drs.
solution is precipitated by ... , as well as those made by other
forming a basic chloride ... that this compound is not a dangerous
together with some pot ... gave it in doses of fifteen grains,
vents this precipitation to ... intervals of an hour (D. C., XXXIII.

...nvestigators there is a small amount ...uantity being so small that no danger ...ther nitrites act similarly. 20. Crystal... triturated with antipyrine gives an ...phenopyrin. On mixing aqueous solutions ...nces a turbidity results, and an oily liquid ...ion in a few hours. 21. Triturating **chloral** ...pyrine together in proper proportions forms the ...oralantipyrine, from which hypnal is made. ...lute aqueous solutions of antipyrine and chloral ...be mixed without separation. 22. When antipyrine ...m **salicylate** are rubbed together a mass or liquid is ...ter a time, the length of time seeming to depend on the ...nt of moisture in the atmosphere. It has been suggested ...the simple mixture is hygroscopic, but more probably a ...mical reaction takes place. Rubbing with **salicylic acid** does ...not give a mass or liquid. 23. Antipyrine gives a liquid or soft ...ss when triturated with **piperazine** and some other solids. [See page 270.] 24. Antipyrine increases the solubility of **quinine sulphate** in water, and at the same time destroys the fluorescence and prevents the green coloration which quinine gives with bromine water followed by ammonia water. 25. The solubility of **caffeine** is said to be increased by antipyrine. (℞ 133–139.)

Apomorphinæ Hydrochloridum. — 1. An aqueous solution of apomorphine hydrochloride rapidly becomes green in color; the exact change which takes place has not been determined. This can be prevented by the addition of a few drops of hydrochloric or acetic acid. It is stated that the solution will not become green if prescribed in bottles, no matter whether white or amber, that do not yield an alkali to water (Pharm. Centrabl., XLV. 843). It is slowly decomposed in boiling water. 2. An aqueous solution is precipitated by the **alkali hydroxides** and **carbonates** and by **lime water** as the free alkaloid, white at first, but quickly turning green or black. 3. Apomorphine dissolved **in** ammonia water develops a purple color. 4. It is precipitated by **tannic acid, picric acid,** and nearly all the **alkaloidal reagents.** [See ALKALOIDS.] 5. With a concentrated solution of **ferric**

chloride it gives a red precipitate, turning black. 6. Concentrated **nitric acid** added to the crystals gives a red solution. 7. Apomorphine hydrochloride in aqueous solution reduces **iodates, permanganates,** and **silver nitrate.** (℞ 140.)

Aqua. — Water precipitates from their alcoholic solutions **oils,** many free **alkaloids** or alkaloids combined with general alkaloidal reagents, some **glucosides,** some **neutral** and **bitter principles, resinous** or **fatty matter,** inert **extractive matter,** and nearly all compounds which are insoluble in water.

Aqua Ammoniæ. — 1. Ammonia combines with **acids** to form salts. 2. It precipitates solutions of salts of **lead, silver, mercury, bismuth, tin, antimony, copper, cadmium, iron, aluminum, chromium, cobalt, nickel, manganese,** and **zinc.** The precipitate is a hydroxide, except in case of silver and antimony, when it is an oxide; in case of lead, it is a basic salt; double compounds are formed in case of mercury. The precipitation many times is prevented or hindered by sugar, glycerin, acacia, citrates, tartrates, and other organic matter. 3. A solution of **corrosive sublimate** is precipitated by ammonia, giving ammoniated mercury (NH_2HgCl). 4. **Calomel** is converted into a black mixture of metallic mercury and mercuric ammonium chloride (NH_2HgCl) (P. & J., 39). 5. With **chlorine** ammonia forms ammonium chloride and nitrogen. If a larger proportion of chlorine gas is used, the ammonium chloride may be decomposed, forming hydrochloric acid and nitrogen. If a still larger proportion of chlorine gas is used, the ammonium chloride may be decomposed into hydrochloric acid and explosive nitrogen chloride. 6. **Bromine** acts somewhat like chlorine. 7. With **iodine** ammonium hydroxide may under certain circumstances form ammonium iodide, ammonium iodate, and water; under different circumstances, ammonium iodide and the explosive iodide of nitrogen are formed. [See Iodum, No. 2.] 8. **Permanganates** oxidize ammonium hydroxide to a nitrate. 9. With **carbolic acid** ammonia gives at first a colorless solution, which slowly becomes green, then deep blue, and finally purplish blue. 10. With **carbolic acid** and **sodium hypochlorite** ammonia produces a deep blue color. 11. With a concentrated

solution of **tartaric acid** ammonia gives a precipitate of ammonium bitartrate. 12. In concentrated solutions of **picric acid** ammonia gives a precipitate. 13. **Gallic acid** gives a yellow to a red brown color with ammonia water. 14. **Chloral hydrate** is decomposed, giving chloroform and a formate of ammonium or chloral-ammonia. 15. Ammonia added to an alcoholic solution of **thymol** slowly gives a green color. 16. It precipitates nearly all **alkaloids** from aqueous solutions of their salts. The precipitate is the free alkaloid, and is sometimes soluble in a large excess of ammonia. 17. Spirit of ammonia has the same incompatibilities as water of ammonia, except as they are modified by the alcohol. With solutions of alkaloidal salts the ammonia liberates the alkaloids, but the alcohol has a tendency to keep them in solution. 18. Aromatic spirit of ammonia is similar to the spirit, except water causes separation of the oils. (℞ 141–143.)

Aquæ. — The medicating or flavoring principle in some waters is thrown out of solution by dissolving certain very soluble inorganic salts in the water; e.g., camphor water gives a precipitate of camphor when a large amount of potassium bromide is dissolved in it. To prevent this, part of the flavoring water may be replaced by distilled water. (℞ 144.)

Argenti Nitras. — 1. Silver nitrate is easily changed to the oxide or metallic silver by **light** and **organic matter.** 2. Silver nitrate in aqueous solution is precipitated as the gray brown silver oxide by the **hydroxides** of **potassium, sodium,** and **ammonium,** the precipitate being soluble in ammonia water. 3. The **alkali carbonates** precipitate the yellow white silver carbonate. 4. **Hydrochloric acid** and the soluble chlorides precipitate the white silver chloride. 5. Soluble **arsenites** precipitate the yellow silver arsenite. 6. Soluble **arsenates** precipitate the red brown silver arsenate. 7. **Sodium phosphate** precipitates the yellow silver phosphate. 8. **Borax** precipitates silver borate, sometimes mixed with a little oxide. 9. The soluble **bromides, iodides,** and **cyanides** precipitate the silver bromide, iodide, and cyanide, the iodide and cyanide being soluble in excess of the precipitant. 10. **Chromates** precipitate the red

brown silver chromate. 11. **Potassium permanganate** with not too dilute solutions of silver nitrate gives a precipitate of silver permanganate. 12. It is reduced to metallic silver by metallic **zinc, copper, tin, mercury,** and **lead**; by **hypophosphites** and **sulphites**; in alkaline mixtures, by **arsenites, manganous salts, antimonous salts**; by **ferrous sulphate.** 13. **Tannic acid** precipitates the silver tannate. 14. Soluble **citrates** give precipitates of silver citrate. 15. Soluble **salicylates** give precipitates of silver salicylate. 16. **Morphine salts** are precipitated by silver nitrate with a red coloration. 17. Free **cocaine** gives a black precipitate, probably of silver oxide. 18. Silver nitrate in solution is reduced to the metallic condition by **glucose, volatile oils, aromatic waters, tartrates, creosote, formaldehyde,** and many other **organic substances,** but not generally by alkaloids. 19. An **alcoholic** solution of silver nitrate gradually deposits metallic silver. 20. Silver nitrate heated with **nitric acid** and **alcohol** produces the violently explosive fulminate of silver. 21. Most salts of silver, except the nitrate and chlorate, are insoluble or sparingly soluble in water. (℞ 149–155.)

Argenti Oxidum. — 1. Silver oxide readily parts with its oxygen, forming explosive mixtures with many substances. Triturated dry with **sulphur, sulphide of antimony, sulphide of arsenic, phosphorus, tannic acid, creosote,** and some other **organic substances,** it is liable to explode or cause ignition. 2. Moist silver oxide decomposes many metallic salts in solution, precipitating the metallic hydroxides, e.g., salts of **bismuth, copper, iron,** and **mercury** (M. & M., IV. 470). 3. **Iodine** in water forms silver iodide and iodic acid. 4. **Chlorine** forms silver chloride and chlorate. 5. A strong solution of silver oxide in concentrated ammonia forms the explosive silver nitride (Ag_3N) on standing or by adding alcohol (M. & M., IV. 470). (℞ 156.)

Argentum Colloidale, *Collargol.* — 1. A solution or suspension of colloidal silver should not be exposed to **light** or **air.** 2. Dilute solutions are precipitated by dilute **acids.** 3. It is incompatible with the usual silver reagents but the presence of albumin retards the precipitations. 4. Cargentos is said to be the colloidal silver

oxide with some casein, and is not precipitated by sodium chloride. 5. Collargol is said to be colloidal silver with a small percentage of albumin and is not precipitated by boiling unless prolonged, as colloidal silver is. It is not precipitated by alkalies. A saturated solution of **sodium chloride** causes precipitation and the precipitate redissolves in water.

Argonin, *Silver Casein.* — 1. Argonin is slightly alkaline to litmus. The solution is opalescent but clears on addition of sodium chloride. Argonin is soluble in solutions of alkalies and of albumin. 2. The aqueous solution gives a flocculent precipitate with **acids**; in case of acetic acid the precipitate dissolves in excess of acid. 3. It gives precipitates with solutions of **lead acetate, alum, silver nitrate, mercuric chloride, ferric chloride, copper sulphate, zinc sulphate, phenol,** and **tannic acid.** 4. The usual reagents for silver do not affect dilute solutions.

Argyrol, *Silver Vitellin.* — 1. **Hydrochloric** and **trichloracetic acids** decompose argyrol in aqueous solution, liberating metallic silver as a brownish black powder. 2. The **alkali chlorides** in small amounts give a slight precipitate of silver chloride. If saturated solutions of the chlorides are added or of ammonium sulphate, the argyrol is precipitated without decomposition. 3. **Tannic acid** precipitates it. 4. It is incompatible with the chlorides of some of the **alkaloids.** 5. A solution of it gives a precipitate with **zinc sulphate, lead acetate,** and **alcohol.** 6. A solution of **mercuric chloride** or a tincture of **ferric chloride** decolorizes a solution of argyrol at once and gives a white precipitate. 7. It is not precipitated by a solution of **albumin** or of an **alkali.** 8. A solution stains the skin.

Arseni Iodidum. — 1. Iodide of arsenic in aqueous solution decomposes into arsenous and hydriodic acids. Iodine is also liberated. 2. Iodide of arsenic precipitates many **alkaloids** from solutions of their salts. 3. Its incompatibilities are similar to those of the soluble iodides and of arsenous acid. [See ACIDUM HYDRIODICUM and ARSENI TRIOXIDUM.]

Arseni Pentoxidum. — 1. The normal alkali arsenates, as sodium arsenate, precipitate neutral solutions of salts of nearly all other common **metals,** as arsenates. Sodium arsenate is

generally alkaline, and may cause precipitation on this account. The precipitate is soluble in mineral acids and sometimes in the presence of ammonium salts. 2. **Tannic acid** with a not too dilute solution of sodium arsenate gives a yellow brown precipitate, the precipitate and the liquid changing to a dark green within a day or two. 3. In acid solutions arsenates are reduced to arsenites by **hypophosphites, sulphites,** and **iodides,** forming respectively phosphoric acid, sulphuric acid, and iodine. 4. Sodium arsenate precipitates solutions of many **alkaloidal salts,** due perhaps to the fact that the arsenate is alkaline and in some cases to the formation of an insoluble alkaloidal arsenate. 5. The arsenates of the alkali metals are soluble in water. The di- and tri-metallic salts of the other metals are insoluble in water, but soluble in the presence of most mineral acids. The arsenates are generally insoluble in alcohol.

Arseni Trioxidum. — 1. Arsenous acid combines with alkali **hydroxides** and **carbonates** to form arsenites. 2. The soluble arsenites (generally not the free acid) precipitate neutral solutions of nearly all **metallic salts,** except those of the alkalies. 3. **Ferric hydroxide** or a solution of **dialyzed iron** gives an insoluble basic arsenite with a solution of an arsenite or arsenous acid. To some extent this is changed to a basic ferrous arsenate (P. & J., 62). 4. Arsenous acid is said to combine with **potassium acid tartrate** to form a double salt, analogous to tartar emetic (Watts, v. 686). 5. A solution of **potassium iodide** with arsenous acid or potassium arsenite in strong solution yields a precipitate of $(KI)_2(As_2O_3)_3$ which is sparingly soluble in water (Watts, I. 377). One dram of potassium iodide dissolved in one dram of Fowler's solution gives only a slight precipitate. 6. Fowler's solution gives a brown white precipitate with **lime water.** 7. With **tannic acid,** it gives a nearly white precipitate which with the liquid turns to a dark, dirty green in less than a day. 8. With a solution of **mercuric chloride** Fowler's solution gives a white precipitate, consisting of a mercurous salt, but not if Fowler's solution is first acidified. If the Fowler's solution is in large excess there will be formed a white precipitate at first and in a few hours a dark gray precipitate of metallic mercury.

9. Fowler's solution is alkaline and may precipitate solutions of **alkaloidal salts** and other **neutral salts.** 10. Arsenous compounds are oxidized to arsenic compounds by **nitric acid, chlorine, chlorates** in acid solution, **iodine** in alkaline solution, **silver salts** in alkaline mixtures, **mercuric** or **mercurous compounds** in alkaline mixtures, **ferric compounds** in alkaline mixtures, **permanganates,** or **chromates.** 11. Fowler's solution on keeping is slowly oxidized to potassium arsenate which is said to be less active physiologically. 12. Arsenous compounds are reduced to metallic arsenic by **hypophosphites** in acid mixtures. 13. The solubility of arsenic trioxide is greatly increased by the presence of acids. 14. Arsenites of the alkalies are soluble in water; barium and strontium are sparingly soluble; the other metallic arsenites are insoluble. They are generally dissolved and decomposed by dilute **mineral acids.** (℞ 157–166.)

Atropina. — 1. Atropine is precipitated from concentrated aqueous solutions of its salts as the free alkaloid by **alkali hydroxides** and the **carbonates** of the **fixed alkalies** (not ammonium carbonate or the bicarbonates). 2. It is precipitated by the **general alkaloidal reagents,** except platinic chloride. [See ALKALOIDS.] 3. By continued heating with **alkali hydroxides, acids,** or **water,** atropine is decomposed forming tropine and tropic acid. 4. **Chromic acid** converts it into benzoic acid (M. & M., I. 362). 5. The precipitation by **gold chloride** is prevented to some extent by the presence of a little sodium thiosulphate. (℞ 167–169.)

Auri et Sodii Chloridum. — 1. Gold and sodium chloride precipitates many of the **alkaloids** from solutions of their salts as double compounds. The addition of sodium thiosulphate to the chloride before mixing with the alkaloidal solution tends to prevent precipitation. If one fourth of a grain of sodium thiosulphate be dissolved in one dram of water and added to one eighth of a grain of gold and sodium chloride dissolved in one dram of water, and this added to one eighth of a grain of strychnine sulphate in two drams of water, no precipitation will take place at once or for several days. Using one half as much water as above stated, a precipitate may be slowly formed. If one

generally alkaline, and may [illegible] will usually take
The precipitate is soluble in [illegible] added to a solution
presence of ammonium salts. [illegible] precipitates the yellow
dilute solution of sodium arsen[illegible] solution of gold
tate, the precipitate and [illegible] solution (the latter
within a day or two. 3. In [illegible] green solution of
to arsenites by **hypophosph**[illegible] [illegible]ic iodide which
respectively phosphoric [illegible] aurous iodide
Sodium arsenate precipitate[illegible] and precipitates
due perhaps to the fact that [illegible] reduced to metallic
cases to the formation of [illegible] **iron**; 5. by **mer**-
The arsenates of the alkali [illegible] and many **organic**
di- and tri-metallic salts of the [illegible]**ous, nitrous, oxalic,**
but soluble in the presence [illegible] ℞ 170–172.)
are generally insoluble in alc[illegible] [illegible]tion are precipitated
Arseni Trioxidum. — 1. [illegible] aqueous solutions
hydroxides and **carbonates** [illegible]**ates, chromates,** or
arsenites (generally not the [illegible] sulphate, phosphate,
tions of nearly all **metallic** [illegible] stannate.
3. **Ferric hydroxide** or a solu[illegible] [illegible]ccharin is only spar-
soluble basic arsenite with a [illegible]tion. 2. It combines
acid. To some extent this is [illegible] sweeter compounds. 3.
(P. & J., 62). 4. Arsenous ac[illegible] zinc and magnesium.
sium acid tartrate to form [illegible]
emetic (Watts, v. 686). 5. [illegible] Betaeucaine hydro-
arsenous acid or potassium [illegible] salt. It is precipitated
precipitate of $(KI)_2(As_2O_3)_3$ [illegible]**rbonates**, and by many
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dram of Fowler's solution [illegible] a weak one. 3. A solu-
Fowler's solution gives a bro[illegible]
7. With **tannic acid,** it gives [illegible] aqueous solution im-
the liquid turns to a dark [illegible]ride is added, and slowly
With a solution of mercuri[illegible] 460). 2. Warming with
white precipitate, consisti[illegible]nic acid (Allen, II. pt. II.
Fowler's solution is first ac[illegible] colors a solution of
large excess there will be fo[illegible], II. pt. II. 203). 4. A
in a few hours a dark gr[illegible]hthol gives a faint bluish

fluorescence with **ammonia** (U. S. P., 78). 5. Alkaline **potassium permanganate** oxidizes it to ortho-carboxy-cinnamic acid (M. & M., III. 460). 6. Betanaphthol when triturated with some solids gives a liquid or a soft mass. (℞ 174.)

Betanaphthol Salicylas, *Betol.* — 1. Betol in alcoholic solution with **ferric chloride** gives a red to red violet color. 2. Triturated with **chloral hydrate** it slowly gives a mass. 3. It is decomposed by **alkalies** into betanaphthol and a salicylate.

Bismuthi Betanaphtholas, *Orphol.* — 1. Mineral acids partly decompose it, forming betanaphthol and the corresponding bismuth salt (U. S. P., 78). 2. It is decomposed into its constituents by the alkaline fluids of the intestine (N. N. R.).

Bismuthi et Ammonii Citras. — 1. Citrate of bismuth and ammonium in aqueous solution is precipitated as the bismuth citrate by most mineral **acids** and the stronger organic acids. 2. It is not readily precipitated by the **fixed alkali hydroxides,** but these on heating liberate ammonia. (℞ 175.)

Bismuthi Oxyiodogallas, *Airol.* — 1. **Moist air** causes the powder to become red. Mixed with **water** airol partially decomposes and turns red. Glycerin tends to prevent this. 2. It is soluble in solutions of **acids** and **alkalies** with decomposition and change of color. 3. With **calomel** it tends to form mercuric iodide (D. C., XLVII. 43). 4. No **metallic** instruments should come in contact with it as they may liberate iodine.

Bismuthi Subgallas, *Dermatol.* — 1. Bismuth subgallate is decomposed by strong **acids** with liberation of gallic acid. 2. Alkali hydroxides dissolve it, giving a yellow solution which becomes red.

Bismuthi Subnitras. — 1. Bismuth subnitrate is slowly decomposed by **water,** liberating nitric acid and forming a more basic nitrate. 2. It is converted into the hydroxide by solutions of the **alkali hydroxides.** 3. In the presence of water the **alkali carbonates** and **bicarbonates** convert it into the subcarbonate, and at the same time some carbon dioxide is liberated. 4. Soluble **iodides** change bismuth subnitrate to an iodide. [See No. 10, under ACIDUM HYDRIODICUM.] 5. **Hypophosphites** reduce bismuth subnitrate to metallic bismuth (P. & J., 296).

6. **Chlorine, chlorinated lime,** and **hydrogen dioxide,** in alkaline mixtures convert the bismuth into the reddish peroxide (P. & J., 104). 7. **Tannic acid** in the presence of water slowly forms the yellow tannate of bismuth. 8. With a solution of **sodium salicylate** bismuth subnitrate is said to form a series of nitro-salicylates, varying in color from white to red orange. Mixtures of these in various proportions made in the author's laboratory showed no perceptible change even on standing. 9. **Tragacanth** with water and bismuth subnitrate gives curdy masses which stick to the sides of the bottle. These can be rubbed out in a mortar if too much water is not present. 10. Bismuth subnitrate is soluble in **glycerin,** but should not be triturated with it for fear of an explosion (Scoville, 336). (℞ 176–179.)

Bismuthi Subsalicylas. — 1. Bismuth subsalicylate with a solution of a **ferric salt** gives a violet color. 2. It is decomposed by **acids** and **alkalies.**

Bromoformum. — 1. Bromoform turns yellow in the light. 2. **Potassium hydroxide** converts it into a bromide and a formate of potassium. 3. With alcoholic **potash** bromoform is decomposed, producing potassium bromide, carbon monoxide, ethylene, and water (Allen, I. 241).

Bromum. — 1. Bromine with **alkali hydroxides** forms bromides and bromates. 2. With **sulphites** it forms sulphates and bromides. 3. With **hypophosphites** it forms phosphates and bromides. 4. Metallic **mercury** and **mercurous compounds** are oxidized to mercuric compounds. 5. **Arsenites** are converted into arsenates. 6. **Ferrous salts** are converted into ferric salts, and in alkaline mixtures into ferrates. 7. Bromine bleaches vegetable **colors.** 8. It combines with many **fixed oils** containing olein, forming addition products. 9. With oil of **turpentine** and some other **volatile oils** it is liable to react violently and may cause ignition. 10. Bromine in **water** gradually forms hydrobromic acid and oxygen (M. & M., I. 536). 11. An **alcoholic solution** is gradually decolorized, forming hydrobromic acid. 12. With **hydrogen dioxide** oxygen is evolved.

Butyl Chloral Hydras. — 1. Butyl chloral hydrate (erroneously called croton chloral hydrate) gradually undergoes de-

composition in aqueous solution. 2. With **alkalies** it is decomposed, producing a formate and propylic chloroform, which splits up with the formation of a chloride of the alkali and dichloride of allylene (Allen, I. 231). 3. It liquefies or gives a soft mass when triturated dry with several solids. [See page 270.]

Cadmium. — The soluble cadmium salts in aqueous solution are precipitated by the **alkali hydroxides,** forming white cadmium hydroxide; by **alkali carbonates,** forming the white cadmium carbonate; by the soluble **sulphides** and **hydrosulphuric acid,** as the yellow cadmium sulphide; by the **alkali chromates,** as the yellow cadmium chromate; by the soluble **phosphates,** as the white cadmium phosphate.

Caffeina. — 1. Caffeine does not readily combine with **dilute acids,** although it unites with concentrated acids. The salts are easily decomposed by water, alcohol, or ether. 2. Caffeine in moderately dilute solutions is not precipitated by the **alkali hydroxides** or **carbonates** or the **general alkaloidal reagents,** but from strong solutions it is precipitated by **tannic acid, phosphomolybdic acid, silver nitrate,** and **mercuric chloride.** 3. Warmed with alcoholic **potassium hydroxide** it forms methylamine, carbon dioxide, and a little ammonia (N. S. D.). 4. A solution of citrated caffeine contains free citric acid which may give trouble sometimes. 5. The solubility of caffeine is increased by the presence of sodium salicylate, sodium benzoate, antipyrine, and potassium bromide (N. S. D.).

Calcii Betanaphtholsulphonas, *Asaprol.* — 1. Exposure to **air** and **light** causes asaprol to darken and become less soluble. 2. In solution it gives a precipitate with a soluble **carbonate, oxalate,** and other agents that precipitate calcium salts. 3. **Mineral acids** regenerate betanaphthol and precipitate it (Analyst, XXVIII. 295). 4. A solution of **ferric chloride** gives a blue color. 5. **Nitric acid** gives a yellow to a red color and this with ammonia gives a yellow, due to the formation of a picrate. 6. With **mercuric nitrate** it gives a yellow color with a golden fluorescence (Analyst, XXV. 292). 7. **Formaldehyde** with sulphuric acid gives a green fluorescence. 8. Asaprol gives a precipitate with a neutral solution of **quinine sulphate.** 9. It

gives a precipitate with a solution of **antipyrine.** 10. Rubbed with some solids it gives masses.

Calcii Hypophosphis. — 1. Calcium hypophosphite in aqueous solution gradually changes to calcium phosphate. 2. Excess of sugar throws calcium hypophosphite out of solution. 3. The presence of hypophosphorous acid increases its solubility in water. [See CALCIUM and ACIDUM HYPOPHOSPHOROSUM.]

Calcii Phosphas. — Calcium phosphate forms soluble compounds with nearly all **acids** except those which precipitate calcium salts.

Calcium. — 1. The soluble calcium salts in concentrated solutions are precipitated by the **fixed alkali hydroxides** as calcium hydroxide; 2. by soluble **sulphates** in not too dilute solutions as sulphate; 3. by soluble **carbonates, phosphates, oxalates,** or **tartrates** as calcium carbonate, phosphate, oxalate, or tartrate. 4. Soluble **citrates** on heating precipitate the calcium citrate.

Calx. — 1. Lime exposed to air absorbs carbon dioxide and water. 2. Its solubility is greatly increased by **glycerin** or **sugar,** probably by forming loose combinations. 3. Lime decomposes most **salts,** combining with their acids. 4. It combines with **water** to form calcium hydroxide which has many of the incompatibilities of the fixed alkalies. [See CALCIUM and LIQUOR POTASSII HYDROXIDI.]

Calx Chlorata. — 1. Chlorinated lime contains calcium hypochlorite, which on account of the easily liberated chlorine makes it a strong oxidizing agent. Other hypochlorites act similarly. 2. It is decomposed by **heat, light, acids,** and **carbon dioxide,** liberating chlorine. 3. It converts **sugar, starch, cellulose,** and similar substances into formic acid. 4. With **alcohol,** some **volatile oils,** or **wood alcohol,** it generates chloroform. 5. Mixed with **glycerin** it reacts violently, giving off white fumes and turning the mass brown. The ultimate products of the oxidation are oxalic acid and carbon dioxide. 6. With **organic substances** in a dry state chlorinated lime causes gradual decomposition with the development of heat, and may cause explosion. [See CHLORUM, CALCIUM, and ACIDUM HYDROCHLORICUM.] (℞ 180.)

Calx Sulphurata. — Sulphurated lime is decomposed by **mineral acids** and **carbon dioxide,** liberating hydrogen sulphide.

Cambogia. — 1. Gamboge gives an orange red solution with a solution of **sodium** or **potassium hydroxide** and the color caused by the latter reagent changes to yellow brown. 2. With **ammonia water** it gives a yellow solution, changing to red and finally brown. 3. With a tincture of **iron** it gives a black brown solution. 4. The resin forms salts with some heavy metals.

Camphora. — 1. Camphor when oxidized by **nitric acid** forms camphoric acid which is insoluble in water, and camphoronic acid which is soluble (M. & M., I. 669). 2. With **chromic acid** it forms camphoronic acid (M. & M., I. 669). 3. **Potassium permanganate** in alkaline solution converts camphor into camphoric acid (M. & M., I. 669). 4. **Bromine** unites with it to form the crystallizable unstable dibromide of camphor, which on heating breaks up into hydrobromic acid and monobromated camphor (Allen, II. 447). 5. **Iodine** acts on camphor, when heated, with evolution of hydriodic acid, and formation of cymene, carvacrol, laurine, and other bodies the nature of which has not been determined (R. & S., III. part V. 427). Iodine dissolved with a large excess of camphor in alcohol still gives the iodine reaction with starch after several days. 6. **Chlorine** has no action on camphor but in the presence of alcohol it forms chlorinated compounds (M. & M., I. 669). 7. Camphor absorbs the gases of **hydrochloric acid, sulphur dioxide,** and **nitric peroxide,** forming colorless liquids, which are decomposed on adding water (Allen, II. 446). 8. Solutions of camphor in alcohol and ether increase the solubility of **corrosive sublimate** and the presence of this salt increases the solubility of camphor in these liquids. 9. **Sugar, magnesia, milk** or **carbonic acid** make it more soluble in water (A. D., 416). 10. When camphor is triturated with dragon's blood, galbanum, guaiacum, or asafœtida, the mixture preserves its pilular consistency indefinitely. With benzoin, tolu, mastic, and ammoniac, the mixture becomes soft on exposure to air. With olibanum, gamboge, and myrrh, the mixture remains pulverulent, though grumous. Asafœtida, gal-

banum, tolu, dragon's blood, olibanum, mastic, benzoin, guaiac, and ammoniac destroy to a greater or less extent the odor of camphor. Heated with resins or fats, camphor unites in all proportions (A. D., 416). 11. Camphor is thrown out of its aqueous solution by dissolving large amounts of **metallic salts** in the water. 12. Camphor produces a liquid or soft mass when triturated with about an equal weight of **betol, guaiacol carbonate,** and many other solids. Camphor and phenol are said to unite in equal molecular proportions to make a compound having a solidifying point of 18.6° C. [See page 270.] (℞ 181–183.)

Camphora Monobromata. — 1. Monobromated camphor with **nitric acid** forms bromo-nitro-camphor and camphoric acid (N. S. D.). 2. With alcoholic **potash** it forms camphor (M. & M., 1. 670). 3. When triturated with **carbolic acid, chloral alcoholate, chloral hydrate, euphorin, pyrocatechin, salol,** or **thymol** it gives a liquid or soft mass. (℞ 184.)

Cannabis Indica. — 1. **Water** added to an alcoholic extract of cannabis indica causes the precipitation of a large amount of resinous matter. This resinous matter is soluble in a concentrated aqueous solution of chloral hydrate. Honey helps to prevent the precipitated resin from forming masses and sticking to the container.

Cantharidin. — 1. Cantharidin combines with **alkalies,** forming soluble cantharidates. 2. It is precipitated from solutions by **neutral lead acetate, silver nitrate, mercuric chloride,** and **copper sulphate.**

Carbo. — 1. Charcoal absorbs many gases, such as **ammonia, hydrogen sulphide,** etc. 2. When mixed with solutions, it absorbs and removes from solution **tannic acid,** many **alkaloids,** many **glucosides,** and a number of **bitter** and **odorous principles, coloring matter, fusel oil, iodine,** and many **metallic salts** (N. S. D.). 3. When triturated with **oxidizing agents,** such as **potassium chlorate** or **potassium permanganate,** there is danger of an explosion.

Carbonates. — 1. Carbonates are decomposed by all common **acids** except hydrosulphuric and hydrocyanic acids, and by some **metallic acid salts,** with liberation of carbon dioxide. 2.

Solutions of potassium and sodium carbonates precipitate solutions of salts of all other common metals; the precipitate is a normal carbonate in case of **silver, mercurous mercury, cadmium, ferrous iron, manganese, barium, strontium,** and **calcium**; it is a hydroxide in case of **tin, aluminum, ferric iron,** and **chromium**; it is an oxide in case of **antimony**; it is a basic carbonate in case of **lead, nickel, bismuth, copper, zinc, cobalt, magnesium,** and **mercuric mercury.** Mercuric chloride is precipitated as the basic chloride. 3. The carbonates of the alkalies precipitate as free alkaloids the aqueous solutions of most **alkaloidal salts** and decompose a few of the **alkaloids.** 4. In the presence of water **bismuth subnitrate** liberates carbon dioxide from the alkali carbonates. 5. Ammonium carbonate causes reactions similar to potassium carbonate, except with **resorcin** and **salts of mercury, copper, silver,** and **alkaloids.** [See AMMONII CARBONAS.] 6. The carbonates of the alkalies are soluble in water. The other normal or basic carbonates are insoluble in water, although many are soluble in excess of carbon dioxide, forming bicarbonates. The carbonates are insoluble in alcohol.

7. The bicarbonates of the alkalies have about the same incompatibilities as the carbonates, although they do not precipitate as many of the alkaloidal or metallic salts. 8. The pure bicarbonates do not precipitate solutions of salts of atropine, hyoscyamine, nicotine, quinine, quinidine, cocaine, coniine, codeine, brucine, or caffeine, unless the solution be quite concentrated or heat be applied (Sohn). 9. Sodium bicarbonate with a solution of **mercuric chloride** produces an effervescence and gives a white precipitate at first which changes to a brown or purple on standing, the change taking place more quickly when the mercury is in excess. Various oxychlorides of mercury are formed (M. & M., III. 217). 10. **Heating** the alkali bicarbonates dry or in aqueous solution changes them to some extent to the normal carbonates. (℞ 185–190.)

Catechu. — 1. Catechu contains a large percentage of tannic acid. [See ACIDUM TANNICUM.] 2. Catechu-tannic acid does not precipitate solutions of tartar emetic, but an aqueous solution of the acid is precipitated by **gelatin** and **albumin.** 3.

Catechu-tannic acid gives a greenish black solution or precipitate with a solution of **ferric salts.**

Cerii Oxalas. — 1. Cerium oxalate with **alkali hydroxides** slowly forms the cerium hydroxide and the oxalate of the alkali. 2. It dissolves in dilute **hydrochloric acid** or dilute **sulphuric acid,** and this solution is precipitated by the alkali hydroxides or carbonates.

Chinosol, *Oxyquinolin sulphate.* — 1. **Soap** and **alkali hydroxides** give a white precipitate with water solutions. 2. A solution of **ferric chloride** gives a green color. 3. **Mercuric chloride** and other metallic salts give colors.

Chloralformamidum. — 1. Chloralamide is decomposed by warm **water** or by **alkalies,** giving chloral hydrate and formamide. The chloral is further decomposed by the alkali giving chloroform and a formate. 2. It reduces **silver nitrate.** 3. Rubbed with **antipyrine** or **menthol** it gives a mass.

Chloralum Hydratum. — 1. Chloral hydrate in aqueous solution slowly undergoes decomposition, forming traces of hydrochloric acid. A neutral alcoholic solution remains permanently neutral (N. S. D.). 2. An aqueous solution, with **alkaline hydroxides, alkaline carbonates,** or **borax,** produces chloroform and a formate of the base. 3. **Potassium permanganate** oxidizes it, forming chloroform, chlorine, carbon dioxide, and oxygen (M. & M., II. 4). 4. Chloral hydrate unites with **hydrocyanic acid** to form chloral-hydrocyanate (Richter, 196). In concentrated solution potassium permanganate oxidizes it to trichloracetic acid (N. S. D.). 5. With **potassium cyanide** it forms dichloracetic acid (M. & M., II. 4). If chloral hydrate and potassium cyanide are rubbed together dry in a mortar, chemical reaction takes place with almost explosive violence, and a large amount of white fumes are given off, leaving a brown mass. If the two are powdered separately, and mixed lightly, the reaction is slower, but a brown mass finally results. 6. In aqueous solution with **potassium iodide** chloral hydrate slowly gives chloroform and iodine (M. & M., II. 2). 7. With **alcohol** in the presence of **water** and certain soluble salts as potassium or sodium bromide, chloral hydrate forms chloral alcoholate, which

may separate as an oily liquid. Further addition of alcohol may cause the liquids to mix. 8. Chloral hydrate in concentrated aqueous solution is a good solvent for **resinous matter**. It also dissolves **morphine, quinine**, and other **alkaloids** to some extent, some glucosides, neutral principles, volatile oils, fats, and coloring principles. 9. A concentrated aqueous solution of chloral hydrate is said to be a good solvent for **starch**, and on adding iodine a cherry red color is produced instead of the blue. Experiments made by the writer always gave the blue color. 10. Chloral hydrate increases the solubility of acetanilid in water. 11. **Camphor** forms an unstable liquid compound when rubbed with chloral hydrate. 12. Chloral hydrate gives a product varying from a stiff mass to a liquid when triturated dry with about an equal weight of agurin, antisepsin, guaiacol carbonate, salocoll, hedonal, quinine sulphate, trional, and many other solids. [See page 270.] 13. It softens oil of theobroma when rubbed with it. (℞ 191–195.)

Chlorates. — 1. Chlorates are liable to cause an explosion when triturated dry or heated with **sulphur, sulphides, sulphites, cyanides, thiosulphates, hypophosphites, nitrites, reduced iron, amorphous phosphorus, iodine, ammonium picrate, tannic acid**, or substances containing it, **gallic acid, carbolic acid, oxalic acid, charcoal, sugar, honey, glycerin, starch, lycopodium, salicylic acid, shellac**, and many other oxidizable substances. 2. Chlorates with **sulphuric acid** detonate or explode, forming chlorine peroxide and a perchlorate. 3. With **hydrochloric acid** chlorates give chlorine and oxides of chlorine. [See CHLORINUM.] 4. In neutral or alkaline solutions chlorates do not usually have an oxidizing effect. 5. Potassium chlorate with potassium iodide is said to form potassium iodate and potassium chloride (Nat. Drug. XXVII, 232). 6. The metallic chlorates are soluble in water and are generally soluble in alcohol, except potassium. (℞ 196–203.)

Chloretone, *Acetone-Chloroform*. — 1. Chloretone gives a mass or liquid when triturated with an equal weight of antipyrine, **euphorin, exalgin, menthol**, or **phenol**. 2. It is decomposed by **weak acids** and **alkalies**.

Chloroformum. — 1. Chloroform when pure is decomposed by **air** and **light** into chlorine, carbonyl chloride ($COCl_2$), and other products; this is prevented by having some oxidizable substance present, as sulphur or alcohol (N. S. D.). The vapors coming in contact with gas light produce chlorine vapors (Merck's Index, 1907, p. 137). 2. The solubility in water is increased by **citric acid** (Bul. Pharm., XIII. 165). (℞ 204–205.)

Chlorum. — 1. Chlorine with a solution of a **hydroxide** of a **fixed alkali** or an **alkaline earth** forms a chloride and a chlorate. If the chlorine is added short of saturation a hypochlorite is formed. 2. With **ammonia water** chlorine gives ammonium chloride and a little nitrogen, or if the ammonia is in excess a little chlorate. If chlorine is in excess explosive nitrogen chloride may be formed. 3. With some **salts** of **ammonium** chlorine is liable to form the explosive nitrogen chloride. 4. Chlorine precipitates solutions of salts of **lead, mercurous mercury,** and **silver** as chlorides. 5. Chlorine water after standing a while is changed to hydrochloric acid. 6. Chlorine is a strong oxidizing agent, and is itself reduced to a chloride by the agents which it oxidizes. With **iodides** it forms iodine and then iodic acid, and in the presence of an alkali a periodate. 7. With **bromides** it forms bromine and in alkaline mixtures a bromate. 8. With **hypophosphites** phosphates are formed. 9. **Sulphites** or **sulphides** are changed to sulphates. 10. **Mercurous, arsenous,** or **ferrous compounds** are changed to mercuric, arsenic, or ferric compounds in acid or alkaline mixtures. 11. With **hydrogen dioxide** oxygen is liberated. 12. **Salicylic acid** is changed to mono- and di-chloro-salicylic acid (M. & M., III. 680). 13. **Glycerin** is converted into oxalic acid and carbon dioxide. 14. Chlorine is rapidly absorbed by **alcohol.** [See ALCOHOL, No. 5.] 15. Chlorine bleaches **indigo, litmus,** and other organic colors. 16. It oxidizes nearly all **organic matter.** (℞ 206–207.)

Chromii Trioxidum, *Chromic Acid.* — 1. Chromic acid combines with the **alkali hydroxides** to form yellow normal chromates and red dichromates. 2. Chromic acid, or chromates in solution with sulphuric acid, are reduced to chromic salts by **tartrates,** producing formic acid, carbon dioxide, and water; 3. by **oxa-**

lates, forming carbon dioxide; 4. by **hypophosphites** (no action in alkaline mixtures), forming phosphoric acid; 5. by **sulphides,** liberating sulphur; 6. by **sulphites,** forming sulphuric acid; 7. by **chlorides,** liberating chlorine; 8. by **bromides,** liberating bromine; 9. by **iodides,** liberating iodine; 10. by **dilute alcohol,** forming aldehyde, and acetic acid. 11. Chromic acid, with **strong alcohol, glycerin, ether, volatile oils,** or other readily oxidizable matter, is liable to cause an explosion or fire. 12. The soluble chromates and bichromates precipitate aqueous solutions of salts of **lead, silver, mercury, bismuth, manganese, barium,** and **strontium** as chromates, generally normal, varying in color from yellow to red. 13. Potassium bichromate precipitates many alkaloids from aqueous solutions of their salts, e.g., **atropine, codeine, hydrastine, quinine, strychnine, morphine** (only in concentrated solutions, 1 : 100). The normal potassium chromate does not precipitate as many of the alkaloids as the bichromate. 14. Bichromates are liable to cause an explosion when triturated with **tannic acid, sugar,** or other substances that are easily oxidized. 15. The chromates of the alkalies, magnesium, calcium, and zinc are soluble in water; the others are sparingly soluble. They are nearly insoluble in alcohol. (℞ 208–209.)

Chrysarobinum. — 1. Chrysarobin yields chrysophanic acid on oxidation. 2. It dissolves in aqueous solutions of the **alkalies** giving a red liquid with a greenish fluorescence. 3. **Lime water** gives a violet color. 4. Sulphuric acid gives a deep red solution. (℞ 210.)

Cinchona. — 1. Cinchona contains a sufficient amount of tannic acid to make its preparations incompatible with many metallic **salts** and other compounds. [See ACIDUM TANNICUM.] 2. The tannic acid gives a color varying from brown to blackish green with solutions of **ferric salts.** 3. The cinchona alkaloids in solution form compounds with the **general alkaloidal reagents,** which compounds are nearly insoluble in water but soluble in alcohol. [See ALKALOIDS and QUININA.]

Citrophen, *Paraphenetidin Citrate.* — 1. It gives a dark red color with a solution of **ferric chloride.**

Cocaina. — 1. Cocaine is precipitated from aqueous solutions of its salts by the reagents that usually precipitate alkaloids. [See ALKALOIDS, Nos. 2 and 3.] 2. Cocaine is quite easily decomposed by strong **acids,** strong solutions of **alkali hydroxides,** or by **hot water,** forming methyl alcohol, benzoic acid, and ecgonine. 3. Mixed with **calomel** in the presence of moisture cocaine hydrochloride turns the mixture gray or even black, due to the reduction of some of the calomel to metallic mercury, while at the same time some mercuric chloride is formed. The mercuric chloride then combines with the alkaloid to form a compound insoluble in water. The free alkaloid cocaine mixed with calomel does not readily darken, but may be made to do so by blowing the fumes of hydrochloric acid over it. 4. Cocaine hydrochloride with yellow oxide of **mercury** gives a mixture that is irritating, due probably to the formation of mercuric chloride. At least a mercuric salt is formed. 5. A concentrated solution of cocaine hydrochloride is precipitated by a solution of **chromic acid** or potassium permanganate. (℞ 211–216.)

Codeina. — 1. Codeine in aqueous solution is not precipitated by alkaline carbonates, bicarbonates, or ammonium carbonate, but is precipitated by most of the other **alkaloidal reagents.** [See ALKALOIDS, Nos. 2 and 3.] 2. Codeine in aqueous solution gives a precipitate with solutions of salts of **iron, lead, copper,** and some other **metals.** This is probably due to the fact that it is quite strongly alkaline and one of the most soluble of the alkaloids. 3. With some **ammonium salts,** as ammonium chloride, codeine liberates ammonia. 4. If codeine is added to a solution of a **morphine salt** morphine is set free and usually precipitated. 5. **Nitric acid** gives a yellow solution with codeine. (℞ 217–218.)

Colchicina. — 1. Colchicine is darkened by exposure to **light.** 2. It is precipitated from aqueous solution by most of the **general alkaloidal reagents,** unless the solution is quite weak. 3. Colchicine is readily decomposed by strong **acids** or strong solutions of **alkalies,** forming colchiceine. Acids generally give a yellow color. Nitric acid gives a blue to a violet color turning brown and then yellow (Sohn, 42). Potassium hydrox-

ide gives a red color (N. S. D.). 4. Most of its salts are decomposed by **water** (M. &. M., II. 234).

Collodium. — 1. Collodion is gelatinized by **carbolic acid** and by a large excess of **creosote.** Alcohol renders the mass more fluid. 2. **Water** separates the gun-cotton. 3. Tincture of **iodine** free from an iodide or hydriodic acid gives a gelatinous mass, which slowly redissolves. The presence of an iodide prevents gelatinization. [See PYROXYLINUM.] (℞ 219–220.)

Coniina. — 1. Coniine becomes yellow and resinoid on keeping and gives off ammonia (U. S. D.). 2. It is not precipitated by the alkali hydroxides or carbonates, but it is by the **general alkaloidal reagents,** except platinic chloride. [See ALKALOIDS.] 3. Coniine coagulates **albumin.** 4. It precipitates solutions of salts of **aluminum, copper, zinc, manganese, iron,** and **silver;** the precipitate with silver is soluble in excess of the alkaloid (U. S. D.). 5. It forms butyric acid when treated with most **oxidizing agents.** 6. An alcoholic solution of **iodine** with coniine gives a brown precipitate, which afterwards disappears, and the liquid becomes colorless (M. & M., II. 246). 7. Vapors of coniine coming in contact with those of **hydrochloric acid** give white fumes.

Copaiba. — 1. Copaiba, with the **hydroxides of the alkalies** or **alkaline earths,** forms saponaceous compounds, in which the resin acts the part of an acid. 2. With one sixteenth of its weight of **magnesia** which has been dampened with water, the resin of the copaiba combines slowly to form a solid mass. A similar change is produced by **calcium hydroxide.** (℞ 221–224.)

Creosoti Carbonas, *Creosotal.* — 1. Creosote carbonate is decomposed by **alkalies,** liberating creosote.

Creosotum. — 1. Creosote reduces some of the **inorganic salts,** such as silver, gold, and copper, to the metallic state. 2. If mixed suddenly or triturated dry with strong **oxidizing agents** it is liable to cause an explosion. 3. It precipitates solutions of **albumin** and **gum** (not gelatin) (N. S. D.). Creosote in large excess gelatinizes **collodion.** 4. Creosote with solutions of **ferric salts** gives a violet blue color, changing to greenish brown, and, unless in very dilute solution, a brown precipitate is

formed. An alcoholic solution of creosote with an alcoholic solution of ferric chloride gives a bluish green color (U. S. D.) 5. Triturated with **silver oxide,** an explosion is liable to take place. 6. With concentrated **nitric acid** reddish fumes of the oxides of nitrogen are given off. With dilute nitric acid a brown resin is formed (U. S. D.). 7. With concentrated **sulphuric acid** it gives a red color, becoming black on adding more acid. 8. Creosote gives a white precipitate with solution of **lead subacetate.** 9. Creosote dissolves a large number of metallic salts and reduces some of them to the metallic condition.

Cresol. — 1. Cresol dissolves in solutions of **alkali hydroxides.** 2. A dilute solution with a solution of **ferric chloride** gives a blue violet. (℞ 225.)

Cupri Sulphas. — 1. Copper sulphate is precipitated by the **fixed alkali hydrates** as blue copper hydroxide, which on standing becomes basic and black. This precipitation is more or less prevented by citrates, tartrates, salicylates, sugar, milk sugar, glycerin and other organic substances. A solution of copper sulphate and acacia is gelatinized by the alkali hydroxides. 2. **Ammonia water** precipitates the cupric hydroxide and in excess dissolves it, forming an intense blue solution. This solution dissolves cotton, filter paper, and other forms of cellulose. 3. **Ammonium carbonate,** like ammonia water, precipitates the copper and then redissolves it, forming a blue solution. 4. The **carbonates of the fixed alkalies** precipitate the copper as a basic carbonate of variable composition. 5. In neutral solutions the soluble **phosphates** give a blue white precipitate of copper phosphate. 6. **Arsenites** in neutral solution give a green precipitate of copper arsenite. 7. Soluble **iodides** reduce and precipitate copper sulphate as cuprous iodide (Cu_2I_2), iodine being liberated. 8. In alkaline mixtures cupric compounds are reduced to cuprous oxide by **arsenous acid, glucose,** and many organic substances. 9. Copper sulphate coagulates a solution of **albumin.** 10. **Tannic acid** precipitates a solution of copper sulphate, and with heat reduces the copper. 11. **Sodium salicylate** with copper sulphate in solution gives a green color, and the copper is not precipitated from dilute solution by alkalies.

12. **Antipyrine** gives a green color to a solution of copper sulphate. (℞ 226.)

Decocta. — The incompatibilities of decoctions are similar to those of infusions. [See INFUSA.]

Diacetylmorphinæ Hydrochloridum, *Heroine hydrochloride.* — 1. Heroine hydrochloride acts much like morphine hydrochloride and is quite easily decomposed by **acids** and **alkalies** forming morphine. 2. **Alkali hydroxides** and **carbonates** precipitate the base from aqueous solutions of the salt. 3. It is usually precipitated by the general **alkaloidal reagents,** though not always in dilute solutions. 4. It lessens the fluorescence of **quinine sulphate.** 5. It reduces **potassium permanganate.** 6. **Apomorphine** is said to be incompatible with it.

Digitalis. — 1. Digitalin is precipitated from solutions by **tannic acid** and **chloride of gold,** not by most of the other alkaloidal reagents (Sohn, 49). 2. With **nitric acid** digitalin gives at first a colorless solution, changing to yellow or green (Sohn, 50). 3. Digitonin is precipitated from aqueous solution by **ammonia, tannic acid,** or **lead acetate** (Sohn, 50). 4. All of the principles of digitalis are quite easily decomposed by strong **acids** or **alkalies.** (℞ 227.)

Elaterinum. — 1. Elaterin combines with the **alkali hydroxides** to form compounds soluble in water, from which solution acids precipitate the elaterin. 2. It is precipitated from alcoholic solution by **lead acetate** and **silver nitrate** (Watts, II. 373).

Emulsa. — Emulsions are broken up by substances which precipitate the emulsifying agent. [For emulsions made with acacia, see ACACIA.]

Epicarin, *Betanaphthol-hydroxy-toluic acid.* — 1. Epicarin is quite strongly acid and combines with **bases** to make salts which are generally sparingly soluble in water, particularly the sodium salt. 2. On exposure to **air** it acquires a reddish color, due to oxidation products. 3. An alcoholic solution of **ferric chloride** gives an intense violet blue color.

Epinephrine, *Adnephrin, Adrenalin, Supracapsulin, Suprarenalin.* — 1. Adrenalin is slightly soluble in water and the

common solvents. 2. It is weakly alkaline and forms salts with **acids,** the salts generally being soluble in water. 3. **Alkali hydroxides** and **carbonates** precipitate it from acid solutions, the precipitate making water-soluble compounds with fixed alkali hydroxides. 4. **Air,** strong **light,** and **heat** are injurious in varying degrees but they are particularly harmful in neutral or alkaline mixtures. Even in acid solutions, air oxidizes it, forming pink, red, and brown solutions and when it has become brown it has become so inert that it should be discarded. 5. **Oxidizing agents** in general render it inert, giving a pink to red color. 6. **Ferric chloride** gives an emerald green color, which on addition of alkalies gives a purple and then a carmine red color. Strong acid prevents reaction. 7. **Silver** and **gold** salts are quickly reduced. 8. **Mercuric chloride** is reduced to calomel. 9. **Iodine** gives a vivid pink color. 10. Phenols, camphors, salts of alkalies or of common alkaloids are not particularly harmful. 11. **Formaldehyde,** even in dilute solution, will render it inert. (℞ 119.)

Ergota. — The active principles of ergot are generally precipitated by **tannic acid, metallic salts, potassium mercuric iodide, alkalies** and some of the **general alkaloidal reagents,** and are decomposed by **heat** and **age.** (℞ 228–229.)

Erythrol Tetranitrate. — 1. Erythrol tetranitrate is decomposed by **warmth** and **sunlight,** turning yellow and giving off nitrous fumes (U. S. D.). 2. Triturated with **glucose** it has caused explosion.

Eucalyptol. — 1. Eucalyptol is oxidized to cineolic acid by **potassium permanganate** (M. & M., II. 526). 2. **Iodine** in potassium iodide gives green crystals; **bromine** gives red crystals; **naphthol** gives addition products (N. S. D.).

Euphorin. *Phenyl urethane.* — 1. Euphorin gives a mass or liquid when triturated with **hedonal, trional,** and many other solids. [See page [illegible].]

Europhen. *Isobutyl orthocresol Iodide.* — 1. **Heat** and **light** tend to liberate iodine, particularly in solution. 2. The solution in oil is of doubtful efficiency, since the iodine slowly liberated combines with the oil. 3. It is not advisable to prescribe it

with substances that have a strong affinity for iodine, as oxides, hydroxides, starch, salts of mercury. 4. An alcoholic solution gives a yellow, flocculent precipitate with **mercuric chloride.**

Exalginum, *Methyl Acetanilid.* — 1. Exalgin liquefies or gives a mass when triturated with many solids. [See page 270.] (℞ 230.)

Ferripyrine. — 1. **Light** decomposes ferripyrine. 2. **Alkali hydroxides, carbonates,** and **bicarbonates** precipitate ferric hydroxide from aqueous solutions.

Ferri Phosphas Solubilis. — 1. The soluble phosphate of iron, being made by mixing solutions of ferric citrate and sodium phosphate, is perhaps a mixture of ferric phosphate and sodium citrate, or it is more probably a sodio-ferric citro-phosphate. When a dilute **mineral acid** other than metaphosphoric acid is added the sodium citrate or the sodio-ferric citro-phosphate is broken up and the ferric phosphate is precipitated. Strong mineral acids may redissolve the precipitate. Metaphosphoric (glacial phosphoric) acid free from orthophosphoric acid does not cause precipitation. 2. In aqueous solution the soluble phosphate of iron is precipitated by **sodium** or **potassium hydroxide** as ferric hydroxide. **Ammonium hydroxide** gives a reddish color, but no precipitate. 3. Soluble phosphate of iron or its solution acquires a blackish color when exposed to **light.** [See FERRICUM and ACIDUM PHOSPHORICUM.] (℞ 231.)

Ferri Pyrophosphas Solubilis. — 1. The soluble pyrophosphate of iron is a mixture or compound similar to the soluble phosphate of iron, and on adding a dilute **mineral acid** the ferric pyrophosphate is thrown out of solution. Strong solutions of mineral acids may redissolve the precipitate. Metaphosphoric acid free from orthophosphoric acid does not cause precipitation. 2. The red brown ferric hydroxide is precipitated from aqueous solutions by **potassium** or **sodium hydroxide.** 3. **Ammonium hydroxide** turns the solution red, but does not cause precipitation. 4. The soluble pyrophosphate of iron acquires a blackish color on being exposed to light. [See FERRICUM and pyrophosphoric acid under ACIDUM PHOSPHORICUM.] (℞ 232–233.)

common solvents. 2. It is weakly alkali[illegible] [illegible]om their
acids, the salts generally being solubl[illegible] [illegible]arbonates as
hydroxides and **carbonates** precipitate it [illegible] is more or
precipitate making water-soluble com[illegible] [illegible]itrates, tar-
hydroxides. 4. **Air, strong light,** and [illegible] the insoluble
ing degrees but they are particul[illegible] [illegible]d **copper** are
alkaline mixtures. Even in acid sol[illegible] [illegible]s chiefly ferric
pink, red, and brown solutions a[illegible] [illegible]acid of the ferric
has become so inert that it sh[illegible] [illegible]gives an insoluble
agents in general render it ine[illegible] [illegible]rin, citrates, and
Ferric chloride gives an em[illegible] [illegible]4. Solutions of the
of alkalies gives a purple a[illegible] [illegible] solutions of ferric
acid prevents reaction. 7. [illegible] [illegible]ecipitation being pre-
reduced. 8. **Mercuric** ch[illegible] [illegible]derable excess of free
Iodine gives a vivid pink [illegible] [illegible]tate the black ferrous
alkalies or of common a[illegible] [illegible]ds to ferrous and liber-
11. **Formaldehyde,** ev[illegible] [illegible]duces ferric to ferrous and
(℞ 119.) [illegible]tation of iron. 6. Soluble

Ergota. — The a[illegible] [illegible]tions of ferric salts as ferric
cipitated by **tannic** [illegible] [illegible]anic acid. 7. **Ferrocyanides**
iodide, alkalies and [illegible] [illegible]ecipitate of ferric ferrocyanide
are decomposed by [illegible] [illegible] to some extent by citrates

Erythrol Tetr[illegible] [illegible]**yanides** give a brown solution
posed by **warm**[illegible] [illegible]ons of ferric salts **sulphites** give
nitrous fumes [illegible] [illegible]ate, which changes on heating or
caused explosi[illegible] [illegible] and the solution becomes nearly

Eucalypt[illegible] [illegible] in excess decolorizes a solution
potassium [illegible] [illegible] the colorless ferric phosphate. 11.
potassium [illegible] [illegible] **hypophosphites** precipitate ferric
naphthol [illegible] [illegible]ate, but in acid solutions the iron is

Eup[illegible] [illegible]ondition and the hypophosphite is
liquid [illegible] [illegible]. **Hydriodic acid** and soluble **iodides**
solids. [illegible] [illegible]duce ferric compounds to ferrous, iodine

[illegible] [illegible]ecipitated if the iodide is entirely decom-
[illegible] [illegible] give precipitates of basic ferric arsenite
[illegible] [illegible]ic salts if they are not too strongly acid.
[illegible] [illegible]senite is changed to some extent to a ferrous

arsenate (P. & J., 62). **Arsenates** give the insoluble ferric arsenate. 14. The official **tannic acid** gives a blue black solution or precipitate of ferric tannate. Phosphoric acid in excess destroys the color by breaking up the compound and forming the colorless ferric phosphate. Some tannic acids give a green black color. With the exception of gentian, quassia, columbo, American columbo, chiretta, and canella nearly all drugs contain tannin. 15. **Gallic acid** gives a blue black color with a solution of ferric chloride. [See ACIDUM GALLICUM, No. 7.] 16. **Acetates** give a deep dull red liquid with nearly neutral solutions of ferric salts, due to the formation of ferric acetate. This solution on heating throws down a precipitate of basic ferric acetate. **Acetic acid** does not increase the color of a solution of ferric chloride unless the iron solution is quite highly diluted. 17. Soluble **benzoates** precipitate nearly neutral solutions of ferric salts as ferric benzoate which is flesh-colored. The presence of an excess of free acid or of alkali tartrate interferes with or prevents the precipitation. 18. With solutions of the **salicylates** ferric salts give a blue violet to violet red solution; the color is destroyed by a large excess of a mineral acid. In concentrated or neutral solutions ferric salicylate may be precipitated. 19. Ferric salts with organic acids, as citric, tartaric, and lactic, are slowly reduced to the ferrous condition in diffused light, more quickly in sunlight, and the organic acid is oxidized to carbon dioxide (Scoville, 337). 20. **Carbolic acid** with concentrated solutions of ferric chloride gives but little increase in color. On diluting with water the solution becomes green and more water changes it to violet blue. 21. In dilute aqueous solutions **creosote** or **guaiacol** gives with ferric chloride a violet blue color which soon changes to green brown. An alcoholic solution of ferric chloride with creosote gives blue green. 22. **Acetanilid** with an alcoholic solution of ferric chloride gives a red color. With an aqueous solution it gives no color unless heated, and then the color fades on cooling. 23. **Antipyrine** gives a red color with a solution of a ferric salt. [See ANTIPYRINA, No. 3.] 24. **Phenacetin** with a tincture of ferric chloride gives a deep red solution. 25. With **pyrocatechin** a solution of ferric chloride gives a green

color; 26. with **pyrogallol** it gives a red; 27. and with **resorcin,** a violet. 28. An alcoholic solution of **salol** gives a violet to red color with a tincture of iron, but when sufficient water is added the color is destroyed and the salol precipitated. 29. Piperazine gives a red brown precipitate. 30. Oil of **wintergreen** gives a violet color with an alcoholic solution of ferric chloride; 31. oils of **cloves, bay,** and **pimenta** give a blue to a green; 32. oil of **cinnamon** gives a brown; 33. oil of **thyme** gives a green brown, changing to red. 34. An alcoholic solution of ferric chloride gives a dark brown green color with **podophyllin**; 35. with **aloin** it gives a green black to a brown black; 36. with **benzoin,** a brown to green; 37. with **gamboge,** a black brown; 38. with **asafœtida** or **storax,** a green brown; 39. with **myrrh,** a red brown; 40. with **guaiac,** a blue to brown; 41. with **balsam of Peru,** a green black; 42. with **balsam of Tolu,** a brown; 43. and with **shellac,** a black. 44. With a nearly neutral aqueous solution of ferric chloride **morphine** gives a blue to green solution, and with **apomorphine** it gives a red changing to a black. 45. Solutions of ferric salts gelatinize mucilage of **acacia.** [See ACACIA, No. 2.] 46. They coagulate solutions of **albumin.** 47. **Glycerin** and **syrup** give a darker color due to hydrolysis into ferric hydroxide and hydrochloric acid (Bul. Pharm., XIX, 389). (℞ 234–251.)

48. The N. F. tincture citrochloride of iron is of the same iron strength as the U. S. P. tincture, though weaker in alcohol, and contains a citrate. This tincture can often be advantageously used in place of the official tincture. With it alkali hydroxides, phosphates, hypophosphites, benzoates, acacia, salicylates, and many other agents do not cause precipitation; iodides do not liberate iodine for several days unless a mineral acid is added; antipyrine, salicylates, phenol, acetates, and some other chemicals do not give the color they ordinarily do with the U. S. P. tincture. It is deserving of more extended use, but should not be used where much quinine sulphate is present or when citrates cause trouble.

Ferrosum. — 1. Ferrous salts are quite quickly changed to basic ferric compounds on being exposed to the **air.** Sugar, glycerin, and organic matter in general retard the oxidation. 2.

Ferrous salts in aqueous solution are precipitated to some extent by the **alkali hydroxides** as the white ferrous hydroxide, quickly changing to the ferroso-ferric hydroxide, which is of a dirty green to a black color. This precipitate ultimately oxidizes to a ferric hydroxide or oxide. Ammonium chloride or sulphate, soluble citrates or tartrates, sugar, glycerin and many organic compounds, dissolve the ferrous hydroxide or prevent the precipitation. 3. The soluble **carbonates** precipitate the ferrous carbonate, white if purely ferrous, but quickly becoming green and ultimately brown, due to the formation of a ferric compound. 4. The soluble **phosphates** precipitate the white or bluish white ferrous phosphate. 5. With nearly neutral solutions **borax** gives a white precipitate. 6. The soluble **sulphides** (not hydrogen sulphide) precipitate the black ferrous sulphide. 7. **Ferrocyanides** precipitate the light blue ferrous ferrocyanide. 8. **Ferricyanides** precipitate the dark blue ferrous ferricyanide. 9. **Arsenites** and **arsenates** give precipitates with solutions of ferrous salts (P. & J., 158). 10. **Tannic acid** with strong solutions of ferrous salts precipitates the white gelatinous ferrous tannate. This quickly oxidizes, forming the nearly black ferric tannate. Ferrous salts usually contain enough of a ferric salt to give the dark color at once. 11. **Gallic acid** with a concentrated solution of a ferrous salt gives a white precipitate which soon turns dark, due to the oxidation of the iron and formation of the ferric gallate. 12. Ferrous salts in solution are oxidized to ferric compounds by salts of **gold or silver,** by **hydrogen dioxide, chromates, permanganates, nitrous** or **nitric acid, chlorine** or **chlorates** in acid solution, **bromine** or **bromates** in acid solution, **iodates** in acid mixture, **mercuric compounds** in alkaline mixture, **arsenates** in alkaline mixtures, and by oxygen of the **air.** 13. The **alkaline citrates** in solution modify the astringent effects of ferrous salts, and dissolve many of the salts not soluble in water.

Ferrum Reductum. — 1. Reduced iron combines with acids to form salts. 2. It is oxidized by moist **air.** 3. In the presence of water it reduces to the metallic condition salts of **copper, bismuth, lead, silver, mercury,** and **antimony.** 4. Triturated dry **with** strong oxidizing agents, such as **potassium permanganate**

or potassium chlorate, it is liable to cause an explosion. 5. In the presence of water iron forms ferrous iodide with **iodine,** and ferrous bromide with **bromine.** 6. Iron is slowly oxidized to a hydroxide by **hydrogen dioxide** water.

Fluidextracti. — 1. Fluidextracts are generally more or less acid and liberate carbon dioxide from **carbonates.** 2. **Water** causes precipitation of inert matter and sometimes active principles.

Gelatinum. — 1. Solutions of gelatin are coagulated by **tannic acid, picric acid, metaphosphoric acid, chlorine water, mercuric chloride, platinum chloride, alumnol, alcohol,** or **formaldehyde.** Aqueous solutions are not precipitated by alum, lead acetate, ferric chloride, dilute acids, or dilute alkalies (N. S. D.). 2. **Heating** an aqueous solution of gelatin for some time renders it incapable of gelatinizing.

Glucosides. — 1. Glucosides are decomposed by prolonged contact with mineral **acids, alkalies, hot water,** or **ferments.** Some glucosides may be decomposed by one of these agents, others by two or more of them. One of the products formed is glucose or some form of sugar. 2. **Tannic acid** or **lead subacetate** generally precipitates the glucosides from their aqueous solutions. 3. The glucosides are not usually precipitated by the alkali hydroxides or carbonates or general alkaloidal reagents. 4. Many of them give color reactions resembling those produced by the alkaloids.

Glycerinum. — 1. It has been generally stated that glycerin with **borax** forms glycerol borate and sodium metaborate. The glycerol borate is decomposed by water, forming boric acid and glycerin. But according to Duncan (Pharm. Jour., LXXXVI, 104) the following reactions take place:

$$Na_2B_4O_7.10\,H_2O + 2\,C_3H_5(OH)_3 = 2\,NaC_3H_5OHBO_3 + 2\,H_3BO_3 + 9\,H_2O.$$

$$Na_2B_4O_7.10\,H_2O + 4\,C_3H_5(OH)_3 = 2\,NaC_3H_5OHBO_3 + 2\,HC_3H_5OHBO_3 + 13\,H_2O.$$

Sodium glyceryl borate is formed in either case but when two molecules of glycerin are used for one of borax, boric acid is

formed while if four molecules of glycerin are used for one of borax, glyceroboric acid is formed. Glyceroboric acid is a much stronger acid than boric. In the first reaction about two grams of borax are used for one of glycerin. In consequence of the formation of free acid, this mixture is incompatible with carbonates, but generally compatible with solutions of alkaloidal salts where borax alone would cause a precipitation. **Glucose, honey,** and some other organic compounds act like glycerin. 2. Strong **nitric acid** mixed with concentrated sulphuric acid converts glycerin into the explosive nitroglycerin. When glycerin is carefully treated with nitric acid, it is converted into a mixture of oxalic acid, glyceric acid, and other organic acids (Allen, II. 304). Warming glycerin with dilute nitric acid may cause a violent reaction. 3. Gently heated with solid **potassium hydroxide** glycerin is converted into potassium acetate and formate (Allen, II. 304). 4. In dilute solutions **potassium permanganate** changes glycerin to formic, propionic, and tartronic acids (M. & M., II. 618). In a strongly alkaline solution oxalic acid and carbon dioxide are formed (Allen, II. 304). Manganese dioxide is precipitated. 5. Oxidizing agents, as **chromates, chlorinated lime, nitrohydrochloric acid, hydrogen dioxide,** or **manganese dioxide** with hydrochloric acid, convert glycerin into oxalic acid and carbon dioxide. When glycerin is rubbed with the dry **oxidizing agents** explosion is liable to take place. 6. Concentrated **sulphuric acid** with glycerin forms acrolein. 7. Glycerin may be made to combine with several organic and inorganic **acids** (U. S. D.). 8. Glycerin unites with **alkalies** and **alkaline earths** to form compounds soluble in water, the former also soluble in alcohol, the latter not precipitated by carbon dioxide (N. S. D.). 9. Glycerin prevents to some extent the precipitation, by alkali hydroxides and carbonates, of solutions of salts of **lead, copper, antimony, aluminum, chromium, iron, zinc,** and **magnesium.** 10. It dissolves most deliquescent salts and increases the solubility of many inorganic and organic salts. 11. Glycerin sometimes precipitates **alkaloidal salts** from their aqueous or acidulated solutions (U. S. D.). 12. It does not mix with most **fixed oils** to form clear solutions. 13. Glycerin is

crystallization takes place in a few minutes. The crystallization is retarded or prevented by dilution with water. Other acids act similarly but more slowly. The same product is formed when antipyrine, ammonium chloride, and formaldehyde are mixed with water. The compound is said to have the formula $C_{30}H_{39}O_3N_7HCl$ (Ph. Era, XLV. 561). 8. A strong solution gives no precipitate with sodium phosphate, salicylate, or benzoate. 9. It forms a crystalline compound with **resorcin.** 10. Added to an excess of **silver nitrate** in solution, a precipitate is produced. 11. A powder of urotropine and **lithium benzoate** will get sticky or liquid in a few days, apparently without decomposition. A similar result occurs when mixed with lithium carbonate, benzoic acid, sodium benzoate, sodium salicylate, or salol. 12. With **sodium carbonate** or **bicarbonate,** ammonia is liberated if urotropine has been previously treated with a mineral acid. 13. With **aspirin,** acetic acid is set free and is soon followed by formaldehyde. 14. Rubbed with **antipyrine** the odor of phenol appears and the mixture liquefies (Chem. Abs., IX. 2690).

Holocainæ Hydrochloridum. — 1. An aqueous solution is precipitated by **alkali hydroxides** and **carbonates** and by **chromic acid** (N. S. D.). 2. It is precipitated from a water solution by many of the **alkaloidal reagents.** 3. The addition of **sodium hypochlorite** to a solution gives a flesh color, with the separation of a violet precipitate.

Homatropina. — The incompatibilities are similar to those of atropine. [See ATROPINA.]

Hydrargyri Chloridum Corrosivum. — 1. Mercuric chloride in aqueous solution is slowly and partly changed to hydrochloric acid and calomel, which change is prevented by ammonium chloride or hydrochloric acid. 2. It is precipitated by solutions of **fixed alkali hydroxides** or **lime water.** The precipitate is the orange yellow mercuric oxide if the hydroxide is in excess, or if the mercuric salt is in excess it will be the red brown basic chloride of mercury. The precipitation is prevented to some extent by the presence of citrates, tartrates, glycerin, sugar, and acacia, although there may form a steel gray precipitate in a few

days. 3. **Ammonium hydroxide** gives the "white precipitate," or "ammoniated mercury," mercurammonium chloride. 4. **Ammonium carbonate** acts like ammonium hydroxide. 5. **Potassium carbonate** or **sodium carbonate** precipitates solutions of mercuric chloride as the red brown oxychloride, which by excess of the carbonate with heat is converted into the yellow mercuric oxide. Citrates, tartrates, glycerin, acacia, and sugar prevent the precipitation to some extent. 6. A solution of mercuric chloride with **sodium** or **potassium bicarbonate** gives an effervescence and a white precipitate. If the mercuric salt is in excess the precipitate turns to a purplish red in a few hours. If the bicarbonate is in excess the precipitate remains white for some time but may ultimately change to the purplish red. Various oxychlorides are formed (M. & M., III. 217). 7. **Borax** precipitates the red brown basic mercuric chloride (Watts, I. 641). 8. **Hydrogen sulphide** and the **alkali sulphides** with solutions of mercuric chloride give mercuric sulphide. The precipitate first formed is white and consists of the union of mercuric chloride and mercuric sulphide; by further addition of the precipitating agent the black mercuric sulphide is formed. 9. The soluble **iodides** precipitate solutions of mercuric chloride as mercuric iodide, first reddish yellow, becoming red. This precipitate dissolves in excess of the soluble iodide or excess of mercuric chloride, forming double compounds. If potassium iodide has been used in excess, the double compound is approximately represented by the formula $(KI)_2HgI_2$. A solution of this double salt is known as "Mayer's reagent" and precipitates nearly all alkaloids from solutions of their salts; the presence of alcohol prevents this precipitation to some extent. 10. The soluble **bromides** precipitate from concentrated solutions of mercuric salts the white mercuric bromide, which is soluble in excess of the soluble bromide or in excess of the mercuric salt (P. & J., 42). Ordinarily no trouble is experienced in combining these. 11. Soluble **phosphates** precipitate from neutral solutions of mercuric chloride the white mercuric phosphate. 12. Mercuric chloride combines with the **chlorides** of the alkalies to form double compounds, which are more soluble in water than mercuric

chloride. 13. **Hypophosphorous acid** and **hypophosphites** reduce mercuric chloride to mercurous chloride and finally to metallic mercury. 14. **Sulphurous acid** and soluble **sulphites** reduce mercuric chloride to mercurous chloride. 15. **Thiosulphates** added to a solution of mercuric chloride give a white precipitate, then yellow, then black. The black precipitate is sulphide of mercury. 16. Mercuric chloride is reduced by metallic **copper, zinc,** or **iron,** in the presence of water, to calomel, and then metallic mercury. 17. **Arsenites** in alkaline mixtures reduce mercuric chloride to calomel and then metallic mercury, and are changed to arsenates. 18. **Tartar emetic** reduces corrosive sublimate and precipitates it as calomel; in alkaline mixtures metallic mercury is formed. 19. **Ferrous compounds** in alkaline mixtures with mercuric compounds are oxidized to ferric compounds, and reduce mercuric to mercurous. 20. **Alcohol** slowly reduces mercuric chloride to calomel (M. & M., 1. 98). 21. According to some writers corrosive sublimate is slowly reduced to calomel by **compound syrup of sarsaparilla** or by **honey** but not by pure syrup; the precipitation is retarded by sodium chloride (U. S. D.). 22. A solution of **albumin** is coagulated by mercuric chloride; this is prevented by the presence of sodium or ammonium chloride. 23. Mercuric chloride precipitates from concentrated aqueous solutions nearly all **alkaloidal salts,** some **neutral** and **bitter principles,** some **glucosides, antipyrine, piperazine, tannic acid, vegetable extractive matter,** and **gelatin.** 24. **Sugar, gum, fats,** and **resins** slowly decompose it, precipitating calomel; heat and light hasten the reaction. 25. **Camphor** increases the solubility of mercuric chloride in alcohol or ether. (R 257–265.)

Hydrargyri Chloridum Mite. — 1. Calomel is changed to the black mercurous oxide by a solution of the **hydroxides** of **potassium, sodium, calcium,** or **barium.** 2. Solutions of the **carbonates** of the **fixed alkalies** convert calomel into a black mass, which is probably a mixture of the basic carbonate and oxide. 3. Calomel with **ammonia water** forms a black mixture of metallic mercury and mercuric ammonium chloride, NH_2HgCl (P. & J., 30). 4. **Ammonium carbonate** acts like **ammonia water.** 5. The soluble **iodides** in the presence of water convert calomel

into yellow mercurous iodide, which is further decomposed by an excess of the soluble iodide, forming metallic mercury and mercuric iodide. This mercuric iodide combines with the soluble iodide to form a double compound which is soluble in water. The presence of a little metallic mercury gives a green color with mercurous iodide. The color becomes more gray or black as the proportion of metallic mercury increases and the mercurous iodide decreases. 6. Soluble **bromides** act similarly to soluble iodides. 7. According to M. Mialhe, calomel is in part converted into corrosive sublimate and metallic mercury by **ammonium, potassium,** or **sodium chloride** at the temperature of the body. A number of other experimenters call attention to the decomposition. (See Watts, III. 896. D. C., XLIII. 176. Proceedings Kansas Pharm. Assoc. for 1897.) The change seems to be more marked in the presence of gastric juice or pancreatin. O. H. Tansy (in Pharm. Rundschau) has made experiments to prove the fallacy of the belief that sodium chloride and calomel are incompatible. Diekman (in Ph. Era, XXII. 7) made experiments showing that the amount of mercuric chloride formed in the test tube is not over six tenths per cent of the calomel taken, and consequently not enough to explain the increased action which the mixture sometimes seems to have. Prof. Pouchet claims that if sodium chloride is capable of converting calomel then it will be necessary to eliminate all of the sodium chloride in the system before giving a dose of calomel. Numerous other experimenters lend their support to the belief that no change, or but very little, takes place, and some bring forward clinical results to prove their point. One writer says that the exaggeration of the toxic effect of calomel, after ingestion of salt or organic acids, arises from the fact that its combination with albuminoid substances in the stomach is facilitated and will yield products much more soluble, so that calomel will be absorbed in larger amounts. Dr. Schaefer, making various experiments on calomel with alkali chlorides, organic acids, and gastric juice, concludes that no mercuric chloride is formed (M. R. XIX. 153). 8. **Hydrocyanic acid** and soluble **cyanides** in aqueous solution convert calomel into metallic mercury and mercuric cyanide and

chloride. 9. **Bicarbonate of sodium** with calomel is said to produce corrosive sublimate very slowly. Whether any change takes place or not, calomel is more frequently given with sodium bicarbonate than without it. 10. Calomel with **alkali sulphites** in solution separates metallic mercury, and a double sulphite of the alkali and mercury goes into solution (M. & M., III. 216). 11. Solutions of **hydrogen sulphide** or **alkali sulphides** convert calomel into the black mercurous sulphide. 12. **Iodine** changes calomel into mercuric chloride and mercuric iodide in the presence of water or alcohol. 13. A mixture of **iodoform** and calomel exposed to light gives red mercuric iodide and the odor of iodoform is lost. 14. Exposed to **sunlight** calomel darkens, due to the separation of metallic mercury; mercuric chloride is also formed. 15. Calomel is said to be changed to metallic mercury and mercuric chloride by heavy trituration. 16. Boiling **hydrochloric acid** converts calomel into mercuric chloride and metallic mercury; if dilute hydrochloric acid is used, no metallic mercury will be separated (M. & M., III. 216). 17. Calomel is reduced to metallic mercury by **nitrous acid, spirit of nitrous ether, hypophosphorous acid,** and in alkaline mixtures by **arsenites** and **tartar emetic.** 18. Mercurous chloride is oxidized to mercuric compounds by **nitric** and **nitrohydrochloric acids, chlorine, bromine, iodine, hydrogen dioxide** (slowly), and in alkaline mixtures by **silver salts.** 19. Calomel reacts with the iodine in iodine compounds like **airol, aristol, europhen,** and **iodoform.** 20. **Soap** is generally alkaline and darkens calomel, probably forming an oxide. 21. Calomel in the presence of moisture is darkened by certain alkaloids, such as **cocaine** or **pilocarpine.** The darkening is due to the formation of metallic mercury, while at the same time some mercuric chloride is formed, which combines with the alkaloid. 22. Calomel is slowly turned dark in the presence of moisture by **antipyrine,** but at once when sodium bicarbonate is mixed with it. Metallic mercury and a mercuric compound are formed. 23. Calomel is said to be changed to metallic mercury and mercuric chloride by **cane sugar** even in the absence of moisture. Considerable time is required for the change. **Milk sugar** gives the reaction more

quickly. **Acacia** and **tragacanth** have similar properties but in a less degree. (℞ 266–274.)

Hydrargyri Cyanidum. — Mercuric cyanide, so far as the base is concerned, has incompatibilities similar to mercuric chloride, except that aqueous solutions are not precipitated by alkali hydroxides or iodides on account of the formation of soluble double compounds. [See HYDRARGYRI CHLORIDUM CORROSIVUM and ACIDUM HYDROCYANICUM.]

Hydrargyri Iodidum Flavum. — 1. Mercurous iodide is rapidly darkened by the **light,** particularly in the presence of **moisture.** The darkening is in proportion to the decomposition into mercuric iodide and mercury. 2. With solutions of **iodides** mercurous iodide is decomposed, forming mercuric iodide and mercury. [See HYDRARGYRI CHLORIDUM MITE, No. 5.] 3. **Ammonia water** converts it into mercuric iodide and metallic mercury (P. & J., 42). 4. Mercurous iodide is reduced and oxidized by the same reagents that reduce and oxidize calomel. (℞ 275.)

Hydrargyri Iodidum Rubrum. — 1. Mercuric iodide is decomposed by solutions of fixed **alkali hydroxides** forming the yellow mercuric oxide and a soluble double iodide of the alkali and mercury. 2. **Lime, sodium carbonate,** and **potassium carbonate** do not decompose mercuric iodide in the presence of water, but do in the presence of alcohol (M. & M., III. 220). 3. With soluble **iodides** it forms soluble double compounds. 4. The incompatibilities are quite similar to those of mercuric chloride. 5. Mercuric iodide is soluble in a solution of sodium thiosulphate, potassium chloride, and many ammonium salts.

Hydrargyri Oxidum Flavum. — 1. Mercuric oxide combines with most **acids** to form salts. 2. With **mercuric chloride** in solution it forms the red brown oxychloride. 3. Mercuric oxide darkens in the **light,** forming mercury and oxygen (M. & M., III. 222) or mercurous oxide (N. S. D.). 4. Mercuric oxide precipitates bases from solutions of their chlorides but not from oxysalts (M. & M., III. 909). 5. It is reduced by many substances as gums, sugar, and lard (N. S. D.). (℞ 276.)

Hydrargyri Salicylas. — 1. Mercuric salicylate is decomposed by a solution of **sodium hydroxide** or **carbonate,** giving a soluble

double compound. 2. Solutions of **chlorides, bromides,** or **iodides** dissolve it (N. & N. Rem., 1916). 3. Strong mineral **acids** decompose it. 4. **Hydrogen sulphide** or ammonium sulphide gives no color or precipitate. 5. A solution of **ferric chloride** gives a violet color.

Hydrargyri Subsulphas Flavus. — 1. Turpeth mineral dissolves readily in **sulphuric, nitric,** or **hydrochloric acid.** 2. Solutions of **fixed alkali hydroxides** decompose turpeth mineral, forming mercuric oxide and the sulphate of the alkali.

Hydrargyrum Ammoniatum. — 1. White precipitate is decomposed by solutions of the **fixed alkali hydroxides** or **lime water,** liberating ammonia and forming the yellow mercuroxy-ammonium chloride (M. & M., III. 208). 2. **Water** decomposes it slowly, forming mercuroxy-ammonium chloride and ammonium chloride (M. & M., III. 208). 3. When ammoniated mercury is triturated with **iodine,** the mixture will puff up after a time from the spontaneous decomposition of nitrogen iodide formed in it; but in the presence of alcohol the decomposition takes place suddenly and with violent explosion (N. S. D.). 4. **Bromine** or **chlorine** causes the evolution of hydrogen and the formation of mercuric bromide or mercuric chloride (M. &. M., III. 208). 5. Ammoniated mercury is dissolved by a solution of **sodium thiosulphate** in the cold, evolving ammonia; if heat is applied mercuric sulphide is formed.

Hydrargyrum Colloidale, *Hyrgol.* — 1. Colloidal mercury in aqueous solution turns silver gray on **heating** (N. S. D.). 2. The metal is precipitated by **acids, bases, salts** of many metals. **Albumin** is not precipitated and tends to prevent the precipitations noted above. 3. Reducible metallic chlorides, as mercuric chloride, are reduced. **Calomel** thus formed remains in solution if the solutions are dilute. 4. **Trituration** tends to transform it into the insoluble form.

Hydroquinone. — 1. Hydroquinone is oxidized to quinone by **ferric chloride, chlorine, dilute nitric acid,** and **chromic acid** (M. & M., II. 730). 2. Strong **nitric acid** oxidizes it to oxalic acid (M. & M., II. 730). 3. An aqueous solution turns brown in the **air,** more quickly in the presence of an alkali. 4. A strong

aqueous solution is precipitated by **ferric chloride,** soluble in excess of the latter (M. & M., II. 730).

Hyoscyamina. — 1. Hyoscyamine is converted into atropine by **heating** to 248° F., or above its melting point, for five or six hours. 2. It is not precipitated by bicarbonates or ammonium carbonate, except from concentrated solutions. 3. It is easily decomposed by warming with **alkalies** or **water**. 4. It has about the same incompatibilities as atropine. [See ATROPINA.]

Ichthyolum. — 1. **Acids** combine with the ammonia and precipitate the ichthyolsulphonic acid as a dark resinous mass which adheres to the sides of the vessel, unless the acid be quite dilute. 2. Alkaline **hydroxides** or **carbonates** liberate ammonia. 3. **Ferric salts** in solution with ichthyol form compounds of iron and ichthyol, while at the same time a partial oxidation of ichthyol is brought about by the ferric salt. **Ferrous salts** precipitate the sulpho-ichthyo ate of iron (Am. D., XXVII. 364). 4. Ichthyol gives precipitates with solutions of many **metallic salts** as ichthyolsulphonates; some of the salts that give precipitates are alum, ammonium bromide, ammonium chloride, magnesium sulphate, potassium bromide, potassium iodide, sodium chloride, and zinc sulphate. 5. **Mercuric chloride** does not give a precipitate at once but does on standing and is reduced to calomel (M. R., x. 284). 6. Solid **iodine** gives a black mixture. Tincture of iodine gives no precipitate with a dilute solution but makes it much darker. Iodine with ichthyol and petrolatum gives a blue and then a green black color. 7. It combines with **formaldehyde** to give ichthoform. 8. With **albumin** it gives ichthyol albuminate (ichthalbin). 9. It precipitates some **alkaloidal salts** only in concentrated solution and some only in dilute solution (M. R., x. 284). The precipitate is sticky. 10. **Hydrogen dioxide** destroys the odor. 11. Rubbed with **ammonium chloride** it gives a stiff mass and some effervescence can be seen. 12. **Alcohol** gives a precipitate but ichthyol is said to be soluble in a mixture of alcohol and ether. 13. Triturating with crystallized **phenol,** ichthyol is made thinner. 14. It has the property of making some insoluble substances soluble in water, e.g., eucalyptol, creosote, camphor, guaiacol,

oils of peppermint, wintergreen, and turpentine (D. C., XLVIII. 65). (℞ 277–281.)

Infusa. — 1. Infusions and decoctions generally contain some tannic acid, albuminous and extractive matters, which are precipitated by many of the metallic salts, such as **mercuric chloride, lead acetate, silver nitrate, tartar emetic,** or **ferric chloride.** 2. When the tannic acid is present in considerable amount they are incompatible with **alkaloidal salts,** because of the formation of the insoluble alkaloidal tannate. 3. Many of the infusions and decoctions are decolorized by a solution of **lead subacetate** or by **aluminum hydroxide.** 4. They should not be mixed with alcoholic solutions of substances insoluble in water.

Iodates. — 1. Iodates sometimes occur as impurities in iodides, and in such cases they liberate iodine when brought in contact with **acids.** 2. Iodates in solution with a dilute mineral acid are reduced to iodine by **hypophosphites, iodides, bromides, nitrites, arsenous acid, ferrous compounds,** and **morphine.**

Iodoformum. — 1. Iodoform heated with a solution of an **alkali hydroxide** gives an iodide and a formate. 2. **Silver nitrate** in solution decomposes iodoform, producing silver iodide, nitric acid, and carbon monoxide (M. & M., III. 33). Triturated dry with silver nitrate, violent reaction takes place with the formation of silver iodide, carbon dioxide, and nitrogen tetroxide (Ph. E., VIII. 302). 3. The color of a mixture of **calomel** and iodoform is yellow, but when it is exposed to light the color changes to red, due to the formation of the red iodide of mercury. Perhaps some chloroform is also produced. 4. When gently heated with yellow **mercuric oxide** iodoform is decomposed, giving carbon monoxide, formic acid, mercuric iodide, and water (M. & M., III. 33). 5. Exposed to direct **sunlight,** iodoform is completely oxidized by the **air,** forming carbon dioxide, iodine, and water (M. & M., III. 33). 6. Iodoform in solution or mixed with a **fatty substance** decomposes in the light, forming iodine and methyl iodide (M. & M., III. 33). For a time the iodine will be taken up by the fatty matter (unless it is petrolatum), forming colorless addition products (M. R., IX. 114). 7. Iodoform with **hydrogen dioxide**

water seems not to be readily affected, but when in solution with ether hydrogen dioxide liberates iodine. 8. **Tannin** slowly deodorizes and decomposes iodoform. 9. **Balsam of Peru** deodorizes it and forms a compound with it (U. S. D.). (℞ 282–285.)

Iodolum. — 1. Iodol remains unchanged when heated below 100° C. (N. S. D.). 2. Oxidizing agents liberate iodine. 3. It should not be given with agents having a strong affinity for iodine. (℞ 286–287.)

Iodophenacetin, *Iodophinin.* — 1. **Water** decomposes iodophenacetin, liberating iodine (M. R., IV. 359). 2. **Alkalies** abstract iodine, regenerating phenacetin (M. R., IV. 359). 3. It should not be mixed with substances having a strong affinity for iodine.

Iodum. — 1. In aqueous solution fixed **alkali hydroxides** or **carbonates** decolorize iodine, forming soluble iodides and iodates. 2. Iodine with **ammonia water** slow y becomes colorless, forming chiefly ammonium iodide, with some ammonium iodate. There is a liability of there being precipitated a dark brown powder, the "iodide of nitrogen," which when dry is easily and violently explosive. Explosive compounds of nitrogen and iodine may also be formed by mixing alcoholic solutions of ammonia and iodine; by adding a solution of chlorinated lime (neutralized by acetic acid) to an aqueous solution of ammonium iodide; by adding ammonia to a mixture of hydrochloric acid and iodic acid; by the action of nitrogen chloride on an aqueous solution of potassium iodide; or by adding an alcoholic solution of iodine to ammoniated mercury. Analyses of the products of these reactions seem to show that at least three different explosive compounds are formed, differing in the number of hydrogen atoms replaced by the iodine (M. & M., III. 560). 3. **Nitric acid** slowly oxidizes iodine to iodic acid. 4. **Hypophosphites** are changed to phosphates, and the iodine is reduced to an iodide. 5. **Hydrogen sulphide** forms hydriodic acid and sulphur. 6. **Thiosulphates** form sulphates and an iodide. 7. **Sulphites** form sulphates and an iodide. 8. **Chlorine** forms iodic and hydrochloric acids, and in the presence of potassium hydroxide a periodate. 9. **Chlorates** in the presence of an acid form chlorides

and iodic acid. 10. **Bromine** in the presence of an alkali hydroxide forms a bromide and an iodate. 11. Iodine changes **mercurous compounds** either in acid or alkaline mixtures to mercuric compounds, and the iodine is reduced to an iodide. 12. Iodine combines directly with metallic **mercury,** forming mercurous iodide and then mercuric iodide. 13. Iodine with **ammoniated mercury** sometimes forms the explosive iodide of nitrogen. 14. In the presence of water iodine combines with metallic **iron** to form ferrous iodide. 15. In the presence of an alkali iodine changes **ferrous compound** to ferric and **antimonious** to antimonic. 16. **Arsenous compounds** are changed to arsenic by iodine in the presence of an alkali. 17. Iodine with **lime** and water forms a bleaching mixture. 18. Iodine combines with most metals and with many non-metals, such as **chlorine, bromine, phosphorus,** or **arsenic.** 19. With iodine in a concentrated solution **potassium cyanide** forms potassium iodide and iodide of cyanogen (M. & M., II. 342). 20. Iodine reacts with **tannic acid** and water. [See ACIDUM TANNICUM, No. 15.] 21. Iodine when heated with **camphor** gives hydriodic acid, cymene, carvacrol, laurine, and other bodies (R. & S., III., part V. 427). 22. Iodine with **alcohol** heated with a fixed alkali yields iodoform. 23. **Methyl alcohol** is slowly oxidized by iodine to formaldehyde and formic acid. 24. Equal proportions of **resorcin** and iodine make a preparation soluble in water and devoid of caustic effect. 25. **Starch** and preparations containing it are turned blue by iodine. By warming the iodized starch, the color is destroyed, but on cooling it again assumes its blue color. 26. Iodine bleaches **litmus** and other vegetable colors. 27. It combines with many of the **fixed oils** to form additive compounds. 28. It combines with many **volatile oils,** and in some cases, as with turpentine, it acts with almost explosive violence. 29. Tincture of iodine free from an iodide or hydriodic acid gives a gelatinous mass with **collodion,** which slowly redissolves after some hours or days. The presence of potassium iodide prevents the gelatinization. 30. In solution iodine slowly forms hydriodic acid. 31. Iodine, either in alcoholic solution or dissolved in an aqueous solution of potassium iodide, precipitates nearly all

alkaloids from aqueous solutions of their salts. A large amount of alcohol present may prevent the precipitation. The precipitates from water are generally red brown and amorphous. Caffeine and theobromine in dilute solutions are not precipitated by iodine. (℞ 288–301.)

Lactophenin, *Phenetidin lactate.* — 1. Lactophenin is decomposed by **acids** and **alkalies.** 2. An alcoholic solution gives a brown red color with **ferric chloride.**

Liquor Acidi Arsenosi. — This solution contains free arsenous and hydrochloric acids. [See ACIDUM ARSENOSUM and ACIDUM HYDROCHLORICUM.]

Liquor Ammonii Acetatis. — Solution of ammonium acetate sometimes contains ammonium carbonate or free acetic acid. [See CARBONATES, AMMONIUM, and ACIDUM ACETICUM.]

Liquor Arseni et Hydrargyri Iodidi. — 1. Donovan's solution liberates iodine on exposure to **air.** It has been suggested to keep a globule of mercury in it to prevent this change. 2. It precipitates nearly all **alkaloids** from aqueous solutions of their salts. 3. **Alkali hydroxides** precipitate the mercury as the oxide. 4. **Silver nitrate** is precipitated as silver iodide. [See HYDRARGYRI CHLORIDUM CORROSIVUM, ARSENI TRIOXIDI, and ACIDUM HYDRIODICUM.]

Liquor Benzosulphinidi. — 1. Solution of saccharin contains some sodium bicarbonate which gives precipitates with many alkaloidal and metallic salts.

Liquor Calcis. — 1. Lime water forms insoluble compounds with **tannic, tartaric, gallic, citric,** and **oxalic acids.** The compounds are generally more soluble in cold water than in hot. 2. **Heat** tends to throw the calcium hydroxide out of solution. 3. Lime water has all of the incompatibilities of the fixed alkali hydroxides and of the calcium salts. [See LIQUOR POTASSII HYDROXIDI and CALCIUM.] (℞ 302–305.)

Liquor Chlori Compositi. — 1. Compound chlorine solution contains a little potassium chloride in addition to the chlorine. [See CHLORUM and ACIDUM HYDROCHLORICUM.]

Liquor Ferri Dialysati. — 1. Many **organic acids,** the **alkali hydroxides** and **carbonates,** some **salts,** and **acacia** precipitate

or gelatinize the solution of dialyzed iron. 2. It combines with **Fowler's solution,** precipitating the arsenic combined with ferric hydroxide.

Liquor Formaldehydi, *Formalin.* — 1. Formic aldehyde in solution slowly deposits the solid crystalline paraformaldehyde which is a condensation product, consisting of three molecules of formaldehyde and which is decomposed by high heat changing back to formaldehyde. It is slowly oxidized to formic acid (N. S. D.). 2. Formic aldehyde with dilute solutions of the hydrates of the **fixed alkalies** and **alkaline earths** is converted into methylenenitan and formose (Richter, 192). Alkalies convert formaldehyde into methyl alcohol and a formate of the base. Formaldehyde neutralizes alkalies but does not form true salts (W. D., XXI. 109). 3. **Ammonia** unites to form hexamethyleneamine. 4. **Hydrogen dioxide water** or **iodine** oxidizes formic aldehyde to formic acid. 5. **Potassium permanganate** probably oxidizes it to formic acid and formates and the heat generated volatilizes the gas more quickly. When these two are used together in disinfecting a room it is at the expense of the formaldehyde. 6. Formaldehyde is a strong reducing agent, reducing salts of gold and alkaline solutions of salts of **silver** and **copper.** 7. It enters into direct combination with albumin, casein, gelatin, agar-agar, starch, acids, and alkali hydroxides (N. S. D.).

Liquor Hydrogenii Dioxidi. — 1. A solution of hydrogen peroxide generally contains a free mineral acid, which has been added to aid preservation. In such a case the solution would have the incompatibilities of the acid. 2. Hydrogen dioxide slowly undergoes decomposition, liberating oxygen, and if the bottle is tightly corked a sufficient pressure may be produced to burst the bottle. Heat and sunlight increase the tendency to decompose. 3. Hydrogen dioxide is a strong oxidizing agent, changing **mercurous** compounds to mercuric, **ferrous** to ferric, **arsenous** to arsenic, **hypophosphites** to phosphates, and **sulphites** to sulphates. 4. It liberates sulphur from **sulphides.** 5. With reduced **iron** and water it gives a little effervescence, and in a few hours a brown precipitate of ferric hydroxide or oxide. 6. **Chromic salts** in alkaline mixtures are oxidized to a chromate.

A chromate in the presence of an acid is reduced to a chromic salt (M. & M., II. 723). 7. Caustic **alkalies** decompose hydrogen dioxide, forming oxygen and water (M. & M., II. 724). 8. **Ammonia** in solution forms ammonium nitrite (M. & M., II. 723). 9. **Iodides** are oxidized, liberating iodine. 10. Bromine is liberated from **hydrobromic acid.** 11. With **chlorine** hydrogen dioxide forms hydrochloric acid and oxygen (P. & J., 287). 12. Hydrogen dioxide reduces **potassium permanganate** and is itself reduced; the products in a solution acidulated with sulphuric acid are manganous sulphate, potassium sulphate, water, and oxygen. 13. It reduces **gold, silver, mercuric mercury,** and **platinum** from their oxides (P. & J., 286). 14. Hydrogen dioxide unites with some acids as **phosphoric, sulphuric, nitric,** and **hydrochloric,** forming mixtures in which it is less easily decomposed (Watts, III. 197). 15. Reaction takes place when hydrogen dioxide water and **formic aldehyde** are mixed, producing formic acid. If the mixture is made alkaline a brisk effervescence ensues. 16. It bleaches **litnus** and most organic colors. 17. Hydrogen dioxide slowly reacts with **alcohol.** 18. It gives a blue color with a tincture of **guaiac** if the guaiac has not been exposed to air and light too long. 19. With **tannic** or **gallic acid** it slowly gives off some gas and colors the solution yellow brown. 20. Hydrogen dioxide oxidizes **carbolic acid** to pyrocatechin, hydroquinone and quinone (M. & M., III. 832). A mixture of hydrogen dioxide water and carbolic acid becomes yellow to red brown in a few hours. 21. Hydrogen dioxide slowly changes **glycerin** to oxalic acid and carbon dioxide. 22. It coagulates a solution of **albumin** (U. S. D.). 23. **Phosphorus** and some substances having a strong affinity for oxygen ordinarily are unaffected by it (U. S. D.). 24. Some substances are not changed by it, and at the same time, have a restraining influence on its oxidizing other bodies (U. S. D.). 25. Quite a number of substances decompose hydrogen dioxide into water and oxygen while they themselves are not affected. Some examples of these are **manganese dioxide, sodium sulphate, potassium bromide, potassium chloride, charcoal,** and some **organic substances** (M. & M., II. 724). (℞ 145–148.)

ides and the **hydroxides of barium, strontium, calcium,** as magnesium hydroxide; 2. by the normal **carbonates** of the fixed alkali metals, as basic carbonate of magnesium; 3. by the alkaline **phosphates,** as magnesium phosphate; 4. by alkaline **arsenates,** as magnesium arsenate; 5. by soluble **sulphites, oxalates,** or **tartrates,** as magnesium sulphite, oxalate, or tartrate respectively. 6. **Ammonium hydroxide** or **carbonate** scarcely precipitates magnesium salts, and may prevent to some extent the precipitation by the fixed alkali hydroxides and carbonates. (℞ 315–316.)

Manganum. — 1. Salts of manganese in aqueous solution are precipitated by the fixed **alkali hydroxides** as manganous hydroxide, white but soon turning brown in the air from oxidation. **Ammonium hydroxide** in the presence of ammonium salts scarcely precipitates manganous salts. 2. The alkali **carbonates, phosphates,** or **cyanides** precipitate the manganous carbonate, phosphate, or cyanide, all of which are white when first precipitated, but darken on exposure to air. 3. Manganous salts in alkaline mixture are oxidized to manganese dioxide by **chlorine, bromine, iodine,** and **hydrogen dioxide.**

Mel. — 1. The presence of honey prevents the precipitation of some of the metallic salts by the alkali hydroxides. 2. Honey decomposes **borax,** with liberation of boric acid, the reaction being somewhat similar to that between glycerin and borax. [See GLYCERINUM, No. 1.] 3. Honey when triturated with strong oxidizing agents, such as **potassium chlorate** or **potassium permanganate,** is liable to form an explosive mixture. 4. Water, added to resinous tinctures, precipitates the resin which adheres to the bottle; honey prevents to a considerable extent the formation of sticky masses and helps to keep the resin suspended.

Menthol. — 1. Menthol when triturated dry gives a liquid or soft mass with many solids. [See page 270.] 2. Fuming **nitric acid** forms an explosive oil (M. & M., III. 203). 3. **Potassium permanganate** in solution decomposes menthol, forming pimelic, formic, propionic, butyric, and oxymenthylic acids (M. & M., III. 203). 4. Adding water to an alcoholic solution

of menthol causes separation of the menthol as an oily liquid. 5. Many concentrated **acids** or concentrated solutions of sodium salicylate dissolve menthol, the addition of water precipitating it again. (℞ 317–319.)

Methylis Salicylas. — 1. Methyl salicylate, or artificial oil of wintergreen, gives with a dilute solution of a **ferric salt** a deep violet color, due to the formation of ferric salicylate. 2. **Alkali hydroxides** decompose it, forming methyl alcohol and a salicylate. 3. Methyl salicylate has incompatibilities quite similar to those of the soluble salicylates. [See Acidum Salicylicum.]

Methylthioninæ Hydrochloridum, *Methylene Blue.* — 1. Methylene blue is decomposed by a strong solution of **potassium** or **sodium hydroxide** liberating the base as a violet precipitate. (M. R., IV. 359.) Sodium hydroxide gives a purplish color and in excess a violet color (N. S. D.). 2. **Reducing agents** cause the formation of a colorless substance, which again takes up oxygen, forming methylene blue (M. R., IV. 359). 3. **Sulphuric acid** changes the blue aqueous solution to a bright green color (M. R., IV. 359). 4. In aqueous solutions **potassium iodide** and **potassium bichromate** precipitate the base as an iodide and a chromate (Allen, III. Part 1, 353).

Morphina. — 1. Morphine combines with **acids** to form salts. 2. Morphine is precipitated from solutions (not too dilute) of its salts by **ammonium, potassium, sodium, calcium,** and **barium hydroxides** by **carbonates** of the alkalies, and by **borax.** The precipitate is soluble in a large excess of the above-mentioned fixed hydroxides, but not so readily in the carbonates. Morphine tartrate is not precipitated by fixed or volatile hydroxides (Blyth, 292). 3. The **bicarbonates** of the alkalies precipitate only a portion of the morphine from neutral solutions of its salts; tartaric acid prevents the precipitation (Watts, III. 1053). 4. Morphine is precipitated from solutions of its salts by **lead subacetate** (not neutral lead acetate), by **potassium chromate,** and by the **general alkaloidal reagents.** 5. **Potassium cyanide** precipitates morphine usually as the free alkaloid, due to the alkalinity of the potassium salt, although some say that morphine cyanide is precipitated. 6. **Silver nitrate** is reduced by morphine

and gives a red coloration (Sohn, 67). 7. **Ferric chloride** in nearly neutral solution gives a blue coloration, changing to a dirty green. This coloration is prevented or destroyed by excess of acid or alcohol. 8. **Nitric acid** gives a red color, changing to an orange and then a light yellow. 9. **Iodates** are reduced, liberating iodine. 10. **Gold chloride** precipitates morphine; the precipitate is first yellow, then blue, and finally purple. The gold is reduced. 11. **Nitrous acid** or **spirit of nitrous ether** produces a yellow color with morphine. Morphine is converted into nitroso-morphine, pseudomorphine, and a base $C_{17}H_{21}NO_5$ (M. & M., III. 436). 12. With **chlorine** a solution of morphine gives a yellow to an orange color, and if ammonia is added it is changed to red brown. 13. **Chlorates** oxidize morphine. 14. Morphine is oxidized by an alkaline solution of **potassium permanganate,** forming an acid (M. & M., III. 436). With an acid solution of potassium permanganate a green coloration is produced. 15. **Iodine** unites with morphine to form iodomorphine (Watts, III. 1052). 16. In a moderately strong aqueous solution morphine is precipitated as the free alkaloid by codeine. [See ALKALOIDS.] (℞ 320–322.)

Naphthalenum. — 1. Naphthalene is converted into nitro- or dinitro-naphthalene by **nitric acid,** according to the strength of the acid used (Allen, II. 199). 2. **Chlorine** and **bromine** form chloro- and bromo-derivatives. 3. Triturated dry with **phenol** or **salol** naphthalene produces a liquid. It gives a damp powder with **pyrocatechin.**

Novocaine. — 1. Novocaine in aqueous solution is precipitated by many **alkaloidal reagents.** 2. The free base is precipitated by an **alkali hydroxide** or **carbonate.** 3. An aqueous solution can be boiled without decomposition.

Olea Fixa. — 1. Fixed oils with solutions of **alkali hydroxides, lime water,** and **oxides** of many metals, form oleates (soaps) of the base and glycerin. 2. The olein of some fixed oils with **nitric acid** or **nitrous acid gas** forms the isomeric elaidin, which is solid. 3. Fixed oils absorb and combine with **bromine** and **iodine,** forming addition products. 4. Concentrated **nitric acid** and concentrated **sulphuric acid** give various color reactions with

different oils. 5. Fixed oils do not dissolve readily in alcohol, except castor and croton, or in glycerin. (℞ 325–326.)

Olea Volatilia. — 1. Volatile oils with concentrated **sulphuric acid** generally give a yellow color, turning brown and sometimes red. 2. Concentrated **nitric acid** gives color reactions with many oils. 3. **Potassium hydroxide** saponifies the resinified portions of the oils. 4. **Ferric chloride** gives colors with some of the oils. [See Ferricum, Nos. 30, 31, 32, and 33.] 5. **Iodine** reacts violently with some oils, particularly the hydrocarbon oils. 6. In aqueous solution the addition of very soluble salts sometimes throws the oil out of solution.

Oleum Æthereum. — 1. Ethereal oil with **water** is slowly decomposed, becoming acid. 2. The sulphuric acid is not precipitated by the general precipitants of this acid because it exists in the form of sulphovinates, which are soluble.

Oleum Amygdalæ Amaræ. — 1. Oil of bitter almonds contains chiefly benzaldehyde with a little hydrocyanic acid; the artificial oil consists of benzaldehyde. 2. Benzaldehyde is readily oxidized by the **air** and by **oxidizing agents,** forming benzoic acid, which may crystallize so as to form a mass. Alcohol prevents this to some extent. 3. With an aqueous or alcoholic solution of **potassium hydroxide** it gives benzyl alcohol and potassium benzoate. 4. **Ammonia water** converts it into crystalline hydrobenzamid, which is again resolved by acids into ammonia and benzoic aldehyde. A mixture of ammonia and the oil turns yellow on standing. 5. **Chlorine** converts it into benzoyl chloride. 6. Benzaldehyde with **resorcin** in the presence of hydrochloric acid forms a resin; **phenol** and **pyrocatechin** act similarly (M. & M., 1. 472). 7. With an aqueous solution of **sodium bisulphite** a crystalline compound is produced.

Oleum Caryophylli. — 1. Oil of cloves dissolved in a little alcohol gives a bright green color when a solution of **ferric chloride** is added. If the solution of ferric chloride is quite dilute, a blue color is produced, which soon changes to yellow (U. S. P., 310). Clove water gives a yellow or brown solution or precipitate with a solution of ferric chloride. 2. **Iodine** dissolves quietly in the oil. 3. **Nitric acid** changes its color to a deep red, and if

[illegible]

[illegible] and [illegible]. 4. [illegible] alkalies [illegible].

Oleum Cinnamomi. [illegible] dissolved in alcohol [illegible] solution of **ferric chloride.** Cinna-[illegible] ferric chloride gives a brown color [illegible]. [illegible] a saturated solution of **sodium bisulphite** [illegible] solidifies to a crystalline mass. 3. **Nitric acid** [illegible] a crystalline mass of cinnamic acid. 4. [illegible] with a solution of **lead acetate.**

Oleum Lini. [illegible] Linseed oil is ignited by **fuming nitric acid.** Nitric acid of sp. gr. 1.35 turns it green and afterwards brown. 2. **Alkali hydroxides** convert it into a soft soap. 3. An alkaline solution of **potassium permanganate** converts it into sativic acid (M. & M., III. 147). 4. Exposed to **air** the oil oxidizes and ultimately becomes solid. If the oil be distributed through cotton, the heat generated by the oxidation may be sufficient to cause ignition. 5. **Iodine** and **bromine** form additive compounds.

Oleum Terebinthinæ. — 1. Oil of turpentine with a small proportion of **sulphuric acid** is partially converted into terebene. 2. Dry **hydrochloric acid gas** with oil of turpentine forms a crystalline monohydrochloride of terpene. This has been called "artificial camphor." 3. **Chlorine** and **bromine** react so violently that the oil is frequently ignited. 4. **Iodine** is dissolved by oil of turpentine to form a green solution, which afterwards becomes hot and gives off vapors of iodine and hydriodic acid; and when considerable quantities of iodine and turpentine oil are brought suddenly together, explosion frequently ensues. 5. Heated with **chlorinated lime,** oil of turpentine yields chloroform. 6. If oil of turpentine is left in contact with **water,** it gradually changes into terpin hydrate. This reaction is hastened by the presence of nitric acid, or by alcohol. 7. **Nitric acid** converts the oil into resinous matter, the violence of the reaction and the products formed depending on the strength of the acid. Some of the products formed are acetic, propionic, butyric, paratoluic, and [illegible] acids. 8. The oil when exposed to **air** slowly absorbs oxygen and forms a resinous substance, which is broken up into hydrogen dioxide and camphoric acid (U. S. D.). **Oil of turpen-**

tine absorbs **oxygen** and gives formic and acetic acids, carbon dioxide, ozone, and resinous bodies (Watts, v. 921). (℞ 327–329.)

Oleum Theobromatis. — 1. Cacao butter is softened by rubbing with one half its weight of **chloral hydrate, camphor, euphorin, menthol, naphthalene, thymol,** or **salol.** The mixture can be hardened by allowing it to stand or by adding some melted spermaceti. (℞ 330.)

Opium. — 1. A solution of opium contains many alkaloids and other substances that are generally incompatible with the inorganic **salts, general alkaloidal reagents,** and many other compounds. 2. Tincture of opium gives a violet red color with tincture of iron. [See MORPHINA, ALKALOIDS, and ACIDUM MECONICUM.]

Orthoform, *New.* — 1. An aqueous solution of orthoform gives a violet to brown black color with tincture of **ferric chloride.** 2. It dissolves in solutions of **alkalies** and **alkali carbonates** and is decomposed by them. 3. It reduces solutions of **silver nitrate** and **potassium permanganate.** 4. With a strong solution of **mercuric chloride** it gives a yellow flocculent precipitate.

Oxidizing Agents. — Strong oxidizing agents, such as chromic, nitric, and nitrohydrochloric acids, chromates, nitrates, chlorates, permanganates, should not be triturated with or mixed with substances that are easily oxidized, as, for instance, **sulphur, sulphides, sulphites, hypophosphites, iodine, charcoal, tannic acid, carbolic acid, honey, sugar, glycerin, starch,** and **vegetable matter.**

Pancreatinum. — 1. An aqueous solution of pancreatin is precipitated by strong **alcohol.** 2. An aqueous solution is precipitated by **heat, mineral acids, metallic salts,** absolute **glycerin,** strong **alcohol,** and **tannic acid.** 3. The activity is lessened by exposure to **acids** or **air.**

Paraldehydum. — 1. Paraldehyde with fixed **alkali hydroxides** forms aldehyde resin which resembles colophony. 2. It is a strong reducing agent and is oxidized to an acid. 3. **Chlorine** forms substitution products. 4. **Hydrocyanic acid** combines with aldehydes to form nitrites (M. & M., I. 107).

4. Paraldehyde liberates iodine from **iodides** (Ph. Era, XVII. 298).

Pelletierinæ Tannas. — 1. Pelletierine tannate in aqueous solution is precipitated by the **alkali hydroxides,** the precipitate being soluble in an excess of the fixed alkalies. 2. It is precipitated by solutions of the soluble salts of **lead, mercury,** and **zinc.** 3. It reduces salts of **gold** and **silver.** 4. **Ferric chloride** gives a blue black color.

Pepsinum. — 1. Pepsin is rendered inert by **alkaline substances** or by prolonged contact with **alcohol.** 2. Hydrochloric acid stronger than 0.5 per cent inhibits and destroys its activity. 3. It is precipitated by tannic acid, mercuric chloride, and many other metallic salts. (℞ 331.)

Peroxides. — 1. Metallic peroxides are decomposed by **water,** liberating oxygen. In case of sodium peroxide the solution is strongly alkaline on account of the sodium hydroxide formed. In case of the peroxides of such metals as zinc, calcium, and magnesium, the decomposition is slow and the hydroxide of the metal does not go into solution to any extent. 2. **Acids** liberate hydrogen dioxide. 3. Peroxides are strong oxidizing agents and should not be mixed with **organic** or easily reducible substances. [See LIQUOR HYDROGENII DIOXIDI.]

Petrolatum. — 1. Petrolatums both solid and liquid take up only a small amount of water, alcohol, or glycerin. 2. They dissolve small amounts of free **alkaloids** but not alkaloidal salts. 3. They are not affected by **alkalies, reducing** or **oxidizing agents.** (℞ 332–336.)

Phenocoll Hydrochloridum. — 1. Phenocoll hydrochloride in aqueous solution is precipitated by the **alkaline hydroxides** and **carbonates** as the free base. 2. **Piperazine** is alkaline and precipitates the phenocoll. 3. Phenocoll acts like an alkaloid and is precipitated from aqueous solution of its salts by many of the agents that precipitate alkaloids. 4. It destroys the fluorescence of **quinine sulphate.** 5. Tincture of **ferric chloride** gives a deep red or violet solution which turns brown green. 6. **Gold** and **silver** salts and **potassium permanganate** are reduced. 7. Tincture of **iodine** gives a brown precipitate which redissolves in

excess of phenocoll, and the iodine is decolorized. 8. It has many of the incompatibilities of the alkaloids. (℞ 337.)

Phenocoll Salicylas, *Salocoll.* — 1. Salocoll gives a violet color with tincture of **ferric chloride.** 2. It destroys the fluorescence of **quinine sulphate.** 3. With **spirit of nitrous ether** it gives a yellow color. 4. It liquefies when triturated with **chloral hydrate.**

Phenol. — 1. Carbolic acid exposed to the **air** absorbs enough moisture to liquefy it. It becomes pink, red, or brown. The coloration is said to be due to ammonia and ammonium nitrite in the air, to the iron in the tin-can container, to the alkali in the glass bottle, to impurities in the phenol, to hydrogen dioxide acting on a metal in the presence of ammonia or to oxidation of phenol itself. The addition of 5 cc. of a 10 per cent solution of sulphurous acid to 20 K. of carbolic acid is said to prevent coloration. 2. Carbolic acid with **ammonia water** gives a colorless solution which slowly becomes green, then deep blue, and finally purplish blue. 3. With **ammonia water** and a solution of **chlorinated soda** it gives a deep blue. 4. Carbolic acid combines with concentrated solutions of **fixed alkali hydrates** to form carbolates. It does not combine with alkali carbonates, except perhaps on boiling. 5. Alkaline solutions of carbolic acid absorb atmospheric **oxygen,** forming dark-colored products. 6. Carbolic acid with the U. S. P. solution of **ferric chloride** gives no change in color, but on adding water a green is produced and on further dilution gives a violet blue color. This violet blue color is prevented or destroyed by most mineral and organic acids, by some salts, and by many organic substances such as alcohol, ether, and glycerin. 7. Adding phenol to a solution of lead **subacetate** (not lead acetate) or to the dilute solution of lead subacetate gives a sticky precipitate, which is soluble in alcohol. Glycerin tends to prevent it; a ten per cent solution of phenol in glycerin gives no precipitate at once with solution of lead subacetate, but a twenty per cent solution does. 8. **Hydrogen dioxide** oxidizes it to pyrocatechin, quinone, and hydroquinone (M. & M., III. 832). The solution slowly becomes yellow to red brown on standing. 9. **Potassium permanganate** oxidizes it to oxalic acid and carbon dioxide (N. S. D.). 10.

Nitric acid oxidizes it to mono-, di-, and tri-nitrophenol, the latter being picric acid. 11. **Nitrous acid** forms nitroso-phenol. **Spirit of nitrous ether** with carbolic acid gives a yellow color, changing to a red brown in a few minutes, then to a deep brown red; after some hours a precipitate forms. 12. Carbolic acid with strong **sulphuric acid** forms phenolsulphonic acid. 13. Phenol is scarcely, if at all, attacked by **iodine** (Watts, IV. 390). Pouring a mixture of equal parts of tincture of iodine and phenol into boiling water gives a colorless solution. In alkaline solution, iodophenols are formed. 14. An aqueous solution of phenol with **bromine water** gives a crystalline precipitate of tribromo-phenol which is not so very soluble in dilute alcohol. 15. Carbolic acid reduces salts of several of the **metals,** as **silver, copper,** and **mercury.** 16. **Gelatin** is completely dissolved by strong carbolic acid but is coagulated when the acid is added in excess to its aqueous solution (Allen, II. 539). 17. Carbolic acid coagulates aqueous solutions of **albumin.** 18. It coagulates **collodion,** separating the nitro-cellulose as a gelatinous mass. 19. Pure **alcohol,** and to a less extent pure **glycerin,** neutralizes the caustic and poisonous effects of phenol. 20. Carbolic acid softens **oil of theobroma** when rubbed with it. 21. On mixing aqueous solutions of carbolic acid and **antipyrine** an oily liquid settles to the bottom. 22. Crystalline carbolic acid gives a soft mass or a liquid when triturated with **agurin, alumnol, chloralamid, quinine sulphate, terpin hydrate,** and a large number of other chemicals. [See page 270.] These reactions are due in some cases to the formation of new chemical compounds, and in some cases probably to the fact that carbolic acid is hygroscopic, and also that it liquefies when warmed by trituration. (℞ 338–341.)

Phenolphthalein. — 1. In solution it is colored red by nearly everything that is **alkaline,** the red color being destroyed by acids.

Phenylis Salicylas. — 1. Salol in alcoholic solution gives a violet color when a dilute solution of **ferric chloride** is added to it. In aqueous solution no increase of color results. 2 **Bromine water** added to an alcoholic solution of salol will cause the formation of long needle-shaped crystals, consisting of a

bromo-derivative. 3. Strong solutions of **alkalies** heated with salol saponify it, forming a salicylate and carbolic acid. 4. When salol is triturated dry with many solids a mass or liquid results. [See page 270.] 5. A mixture of salol with 10 per cent of beta-naphthol melts at 34° C.; with 17 per cent antipyrine it melts at 30° C.; with 14 per cent of urethane, at 29° C.; with 55 per cent menthol, at 28° C.; with 39 per cent chloral hydrate, at 17° C.; with 34 per cent thymol, at 13° C.; with 44 per cent camphor, at 6° C.; with 7.5 per cent sulphonal, at 34° C.; with 4 per cent phenacetin, at 37.5° C. (M. R., XXII. 98). (℞ 342–345.)

Phloridzinum. — 1. Phloridzin exposed to the air in the presence of **ammonia** acquires a purple color. 2. Heating with dilute **acids** it is decomposed forming sugar and other compounds.

Phosphorus. — 1. Phosphorus is oxidized in the **air** forming oxides of phosphorus, and may cause fire. 2. A warm solution of **potassium** or **sodium hydroxide** or **lime water** with phosphorus gives a hypophosphite and phosphorus hydride gas. 3. In the presence of water, **chlorine, bromine,** or **iodine** oxidizes phosphorus and forms phosphoric acid, and hydrochloric, hydrobromic, or hydriodic acid. 4. Phosphorus is oxidized by **nitric acid, chromic acid, old oil of turpentine,** and other substances rich in oxygen. 5. When phosphorus is triturated with **potassium chlorate, chromic oxide, lead dioxide, mercuric oxide, silver oxide, potassium bichromate, potassium nitrate, sulphur,** or **sulphides,** explosion is liable to take place. (℞ 346.)

Physostigmina, *Eserine.* — 1. Physostigmine is precipitated from aqueous solutions of its salts by the **general alkaloidal reagents,** except picric acid and platinum chloride. 2. Alkalies give a white precipitate which immediately turns pink and dissolves in excess of the alkali, forming a pink or red solution which fades to a yellow green. 3. Aqueous solutions of its salts soon turn red. A drop of a ten per cent solution of hypophosphorous acid is said to prevent the change. The red color is due to the formation of rubreserine. 4. Heating a solution of a salt decomposes the physostigmine so that **heat** cannot be used

for sterilization. 5. **Gold chloride** gives a blue to a violet coloration. 6. A solution of **chlorine** or **bromine** gives a red coloration. 7. **Nitric acid** gives a yellowish red color.

Picrotoxinum. — 1. Picrotoxin is soluble in solutions of acids and alkalies without combining with them (N. S. D.).

Pilocarpinæ Hydrochloridum. — 1. Pilocarpine hydrochloride in aqueous solution is precipitated by the reagents that generally precipitate alkaloids, except that it is not readily precipitated by alkali hydroxides and carbonates. 2. When this alkaloidal salt is mixed with **calomel** in the presence of moisture a darkening occurs. This is probably due to the separation of metallic mercury while at the same time some mercuric chloride is formed which combines with the alkaloid. Pilocarpine nitrate gives no black color (U. S. P.). 3. **Potassium permanganate** oxidizes it to pyridin (M. &. M., IV. 275). (℞ 347–348.)

Piperazina. — 1. Piperazine is strongly alkaline and combines with **acids** to form salts. 2. With an aqueous solution of piperazine **alum** gives a white precipitate. 3. **Ferrous sulphate** gives a dark green precipitate which turns brown on standing. 4. **Ferric chloride** gives a red brown precipitate. 5. An aqueous solution of piperazine precipitates solutions of **mercuric chloride, copper sulphate, lead acetate, zinc sulphate, potassium mercuric iodide, Donovan's solution,** tincture of **iodine,** and **picric acid.** 6. On account of its strong alkalinity piperazine gives precipitates with solutions of **alkaloidal salts** and with some **inorganic salts.** 7. **Potassium permanganate** and **silver nitrate** are reduced by piperazine. 8. **Sodium hypochlorite** solution forms a body with piperazine that explodes when heated to a temperature of 80°–85° C. (M. & M., IV. 349). 9. **Bromine water** forms dibromopiperazine (M. & M., IV. 349). It decolorizes bromine water without giving a precipitate. 10. With **spirit of nitrous ether** piperazine gives a yellow to a red solution. 11. **Quinine** is said to give an amorphous violet brown body with piperazine (M. & M., IV. 349). Piperazine gives a white precipitate with a solution of quinine sulphate and destroys the fluorescence. 12 **Phenol** combines with piperazine. 13. A solution with tannic acid gives a green color. 14. When piperazine is triturated dry

with **butyl chloral hydrate, acetanilid, antipyrine, carbolic acid, chloral hydrate,** or **phenacetin,** a liquid or soft mass is formed. This is due in some instances to chemical combination and sometimes to the fact that piperazine is very hygroscopic. (℞ 349–350.)

Plumbi Acetas. — 1. Lead acetate in aqueous solution is precipitated by the **fixed alkali hydroxides** as lead hydroxide which is soluble in excess of the alkali hydroxide. The precipitation is prevented by the presence of glycerin and sugar to some extent. 2. **Ammonium hydroxide** does not precipitate lead acetate, except from a concentrated solution. 3. The soluble **carbonates** precipitate the white basic carbonate of lead. 4. **Borax** precipitates the white lead borate. Precipitation is prevented to some extent by glycerin and sugar. 5. **Sulphuric acid** and the soluble **sulphates** precipitate the white lead sulphate. 6. **Hydrochloric acid** and the soluble **chlorides** precipitate from not too dilute solutions of lead acetate the white lead chloride. 7. The soluble **bromides** precipitate the white lead bromide. 8. The soluble **iodides** precipitate the yellow lead iodide. 9. Soluble **chromates** precipitate the yellow lead chromate. 10. **Sodium phosphate** precipitates the white lead phosphate. 11. **Alkali sulphites** precipitate the white lead sulphite. 12. The soluble **cyanides** precipitate white lead cyanide. 13. **Tannic acid** and solutions containing it precipitate the yellow-gray lead tannate. 14. Solutions of lead acetate are precipitated by neutral soluble **benzoates, citrates, tartrates,** and **salicylates.** 15. **Pyrogallol** gives a white precipitate which becomes brown and black on exposure to air and light. 16. Lead acetate gives a precipitate with some **coloring matters, gums, resins, neutral principles, glucosides,** and **alkaloids.** 17. With a solution of **opium** lead acetate forms the acetates of the alkaloids and the insoluble lead meconate and sulphate. 18. Lead acetate gives a liquid or soft mass when rubbed with **alum, zinc sulphate,** and other solids. [See page 270.] (℞ 351–354.)

Potassii Bitartras. — 1. Cream of tartar combines with the **hydroxides** and **carbonates** of the **alkalies** to form **neutral soluble** salts. 2. Cream of tartar becomes more soluble in solutions of

borax or **boric acid.** 3. It is acid in reaction, and has the incompatibilities of tartaric acid. [See ACIDUM TARTARICUM.]

Potassii Permanganas. — 1. Potassium permanganate in acid solution is reduced to the manganous condition by **nitrous acid** and **nitrites,** forming nitric acid; 2. by **hydrochloric acid** and **chlorides,** liberating chlorine; 3. by **hydrobromic acid** and **bromides,** liberating bromine; 4. by **hydriodic acid** and **iodides,** liberating iodine; 5. by **sulphites** and **hyposulphites,** forming sulphates; 6. by **mercurous compounds,** forming mercuric compounds; 7. by **arsenites,** forming arsenates; 8. by **ferrous compounds,** forming ferric compounds; 9. by **hypophosphites,** forming phosphates; 10. by **ammonia,** forming nitrates. 11. With **hydrogen dioxide water** mixed with sulphuric acid, potassium permanganate forms manganous sulphate, potassium sulphate, water, and oxygen, the oxygen coming from both the permanganate and hydrogen dioxide. 12. **Tartaric acid** is converted into formic acid and carbon dioxide, more readily in a neutral or alkaline mixture (M. & M., IV. 642). 13. **Carbolic acid** is oxidized by potassium permanganate, forming oxalic acid and carbon dioxide. 14. **Alcohol** is oxidized to aldehyde and acetic acid, the manganese dioxide and monoxide being precipitated. 15. **Glycerin** gives a precipitate similar to that produced by alcohol, and is oxidized to formic, propionic, and tartronic acids and carbon dioxide (M. & M., II. 618). 16. In dilute aqueous solution potassium permanganate is reduced by nearly all **organic matter;** in concentrated solution the reaction may be so great as to cause explosion. 17. When potassium permanganate is triturated dry with **sulphur, sulphides, reduced iron, hypophosphites, charcoal, sugar, glycerin, alcohol, tannic acid, oxalic acid, picric acid, fats, oils, gums,** and other **readily oxidizable matter,** an explosion is liable to ensue. 18. The permanganates are all soluble in water, except silver, which is sparingly soluble. They are insoluble in alcohol. (℞ 355–361.)

Potassium. — 1. Potassium salts in the presence of a solution of **platinic chloride** and hydrochloric acid give a yellow precipitate of a double compound of platinum and potassium chloride. 2. Most neutral potassium salts in not too dilute aqueous solution

with **sodium bitartrate** give a precipitate of potassium bitartrate. 3. A solution of the hydrate or carbonate of potassium with an excess of **tartaric acid** gives a precipitate of potassium bitartrate. [See LIQUOR POTASSII HYDROXIDI.]

Protargol, *Silver Protein.* — 1. Protargol is very slightly alkaline. It turns darker on exposure and should be protected from **light.** 2. An aqueous solution gives no precipitate with ammonia, but with considerable **potassium** or **sodium hydroxide** it gives a little precipitate, and the solution becomes darker. 3. Dilute **acids** give precipitates (said to be unchanged protargol) which dissolve on diluting with water or adding strong acids. 4. It gives precipitates with many of the astringent **metallic salts,** as silver nitrate, lead acetate, zinc sulphate, alum, ferric chloride, and mercuric chloride. The cautious addition of dilute ammonia water sometimes partially dissolves the precipitates, but reprecipitation may follow. 5. Protargol reduces **potassium permanganate.** 6. It gives precipitates with solutions of many **alkaloidal salts.** It has been suggested to use a one and a half per cent of boric acid solution as a solvent. This is not always sufficient and a saturated solution of boric acid works better, particularly with cocaine hydrochloride. (℞ 362–363.)

Pyoktannin. — 1. Pyoktannin in solution is decomposed slowly in the **light.** 2. Fixed **alkali hydroxides** added to a solution of pyoktannin decolorize the solution and cause a deposit of a red precipitate. 3. **Ammonia** decolorizes a solution of pyoktannin and gives a purplish precipitate. 4. Pyoktannin is said to be incompatible with **mercuric chloride.**

Pyramidon, *Dimethylamido Antipyrine.* — 1. A solution of pyramidon is colored a deep blue to a violet by **nitric acid,** the color being discharged by excess of acid. 2. **Nitrous acid** or **spirit of nitrous ether** gives a similar reaction. 3. **Silver nitrate** gives a blue color, quickly giving a black precipitate of metallic silver. 4. **Ferric chloride, hypochlorites,** and many oxidizing agents give a blue to violet color. 5. Tincture of **iodine** gives a violet liquid with pyramidon and an excess of iodine gives a brown precipitate. Iodine is said to be added on. 6. Stable **iodides** give no reaction at once. 7. A solution of **mercuric**

piperazine. 11. When the alkaloid quinine is heated with solutions of **ammoniacal salts** ammonia gas is liberated. 12. Quinine sulphate is oxidized by **potassium permanganate** to pyridin tricarboxylic acid, oxalic acid, and ammonia (M. & M., IV. 375). 13. With **resorcin** a solution of quinine sulphate or bisulphate gives a precipitate. 14. Quinine bisulphate in **sunlight** turns yellow and then brown red. 15. When quinine sulphate is rubbed with **phenol** or **thymol** it gives a soft mass; with **chloral hydrate** it gives a damp powder or stiff mass. 16. The solubility of quinine sulphate in water is increased by the presence of certain compounds, as **ammonium chloride, potassium nitrate,** and **antipyrine.** [See ALKALOIDS.] (℞ 367–375.)

Quininæ Æthylcarbonas, *Euquinine.* — 1. Euquinine is slightly alkaline. 2. It forms crystallizable salts with **acids** and with sulphuric acid the solution is fluorescent.

Quinine Carbonic Ester, *Aristochin.* — 1. Aristochin dissolves in **acids** and gives a bluish green fluorescence with acids containing oxygen. 2. Tincture of **iodine** added to an alcoholic solution gives a precipitate that dissolves in alcohol if too much iodine is not added. 3. It gives a deep red color with tincture of **ferric chloride.** 4. The acid solution gives precipitates with agents that precipitate quinine from its solutions. 5. It gives a mass when triturated with **menthol** or **thymol.**

Resina. — 1. Pine resin when triturated with **menthol, salol, carbolic acid,** or **urethane** makes a liquid or sticky mass. 2. **Nitric acid** oxidizes it to isophthalic and trimellitic acids (M. & M., I. 1). 3. **Potassium permanganate** oxidizes it to formic, acetic, and carbonic acids (M. & M., I. 1).

Resinæ. — 1. With aqueous solutions of **alkali hydroxides** or **carbonates** resins form resin soaps which are generally soluble in water. 2. **Nitric acid** converts them into artificial tannin (U. S. D.). 3. Concentrated **sulphuric acid** dissolves many of the resins with decomposition and gives color reactions with some. 4. Tincture of **ferric chloride** gives different colors with resinous substances. [See FERRICUM, No. 26.] 5. **Alcohol** containing **hydrochloric acid** is colored red to violet by myrrh; yellowish brown to green by guaiac; yellow, changing through

solution of **ferric chloride** in excess (M. & M., IV. 359). 9. Pyrogallol in aqueous solutions reduces salts of **silver, mercury,** and **gold,** and it is oxidized to acetic and oxalic acids (Richter, II. 164). 10. Pyrogallol gives a liquid or soft mass when rubbed with many solids. [See page 270.] (℞ 365–366.)

Pyroxylinum. — 1. Soluble gun-cotton when damp undergoes decomposition, and may ignite or cause an explosion. 2. Treated with **alkalies** in concentrated solution it is decomposed, giving up its nitric acid. 3. The nitro-cellulose is converted back to cellulose by **reducing agents,** such as ferrous salts or alkali sulphides. [See COLLODIUM.]

Quinina. — 1. Quinine unites with **acids** to form salts. 2. Quinine is precipitated from aqueous solutions of its salts by all the reagents mentioned under ALKALOIDS, Nos. 2 and 3, except bromides and iodides. 3. Concentrated solutions of quinine sulphate are precipitated by **potassium iodide.** In acid solutions it is slowly precipitated by the iodine liberated from the iodide by the action of the acid and air. It is preferable to leave out the acid and use quinine bisulphate. 4. **Hypophosphorous** acid aids the solution of quinine sulphate, but if added in sufficient amount **potassium hypophosphite** destroys the fluorescence and causes precipitation. 5. Quinine is precipitated from solution of its salts by the **alkali acetates** as the voluminous quinine acetate. [See ACIDUM ACETICUM, No. 4.] 6. **Citric acid** aids the solution of quinine sulphate in water. Adding an **alkali citrate** destroys the fluorescence and precipitates the quinine. 7. Quinine is precipitated from its concentrated aqueous solutions by **benzoates, salicylates,** and **tartrates,** the precipitate generally being bulky. 8. According to Scoville, quinine in water solution with **organic acids,** as acetic, citric, or salicylic acids. is slowly decomposed, more quickly in light and rapidly when heated, into the poisonous quinotoxin. Free mineral acids tend to prevent the change (Jour. A. Ph. A., IV. 590). [See comment on prescription No. 19.] 9. Quinine gives a blue fluorescence with nearly all **acids** that contain oxygen. 10. The fluorescence is destroyed by the **halogen acids, salts** of the **halogens, resorcin, antipyrine, acetanilid, phenacetin, phenocoll hydrochloride,** or

gases are given off (Allen, I. 271). 5. Sugar warmed with dilute solution of **acids**, or heated for some time with **water** is changed to invert-sugar. 6. When a concentrated solution of sugar and **potassium hydroxide** is heated, carbon dioxide, acetone, acetic, propionic, and oxalic acids are formed (M. & M., IV. 551). 7. Sugar combines with sodium chloride, forming deliquescent crystals (N. S. D.). 8. **Chlorine** or **bromine** oxidizes sugar to gluconic acid, glucose, and other products. The same reaction takes place in the presence of lead or silver **oxide** (M. & M., IV. 551). 9. **Iodine** with potassium carbonate and sugar yields a little iodoform (M. & M., IV. 551). Iodine is converted into hydriodic acid by heating with a solution of sugar (N. S. D.). 10. Dilute **chromic acid** solution oxidizes sugar to oxalic, formic, and carbonic acids (M. & M., IV. 551). 11. **Potassium permanganate** converts sugar into oxalic, formic, and carbonic acids (M. & M., IV. 551). 12. Sugar triturated with **potassium chlorate, permanganate,** or **bichromate,** or with other strong oxidizing agents, is liable to cause an explosion. 13. Syrup of hydriodic acid or ferrous iodide sometimes slowly turns brown, due to the action of the acid or iodide on the sugar making caramel. Mineral acids and some salts when heated with syrup cause a similar reaction. 14. Exposed to the **light** it slowly changes into glucose (N. S. D.). 15. Sugar renders the **fixed** and **volatile oils** to a certain extent miscible with water and forms with them an imperfect combination (N. S. D.). 16. Sugar has some reducing effect and retards oxidation by the air of some metallic salts, particularly ferrous.

Saccharum Lactis. — 1. Milk sugar in alkaline solution reduces salts of **copper.** 2. **Nitric acid** first inverts milk sugar and then forms mucic and saccharic acids, and if heated forms tartaric and racemic acids and finally oxalic acid. 3. Dilute **acids** invert milk sugar, forming dextrose and galactose. 4. **A** mixture of sulphuric and nitric acids with milk sugar **gives** lactose pentanitrate, which is explosive (M. & M., IV. 553). 5. **Chromic acid** with milk sugar yields aldehyde (M. & M., IV. 553). 6. **Alkali permanganates** oxidize milk sugar. 7. **Silver oxide** oxidizes it, forming oxalic, glycollic, and lactonic acids

(M. & M., IV. 553). 8. Milk sugar with a solution of **iodine** and sodium bicarbonate yields a little iodoform (M. & M., IV. 553). 9. Triturated with **oxidizing agents,** it is liable to cause an explosion.

Salacetol. — 1. Salicyl-acetol is decomposed by **alkali hydroxides,** forming a salicylate.

Salicinum. — 1. Salicin is not readily precipitated by any of the common precipitants. 2. Dilute **acids** and **water** with heat change it to glucose and saligenin.

Salophen. — 1. Salophen dissolves in solutions of **potassium** or **sodium hydroxide** but is decomposed by them. Boiling the sodium hydroxide solution a blue color is developed, beginning at the top (N. S. D.). 2. Tincture of ferric chloride with an alcoholic solution gives a brown red to violet color.

Saloquinine. — 1. **Acids** dissolve it. 2. From the acid solutions, **alkali hydroxides** and **carbonates** and the general alkaloidal reagents precipitate it. 3. With a very dilute solution of **ferric chloride,** its alcoholic solution gives a reddish violet color.

Salvarsan, "*606.*" — 1. Salvarsan is easily decomposed in the **air.** 2. The water solution is acid and on adding an **alkali hydroxide** or **carbonate,** a precipitate of the free base is formed. 3. Dilute **mineral acids** do not change salvarsan. 4. It is decomposed by heating with **potassium permanganate,** giving off ammonia (N. & N. Rem. 1916). 5. **Ferric chloride** gives a brownish violet color gradually changing to a dark red. 6. A dilute nitric acid solution of **silver nitrate** gives a dark yellow precipitate, which quickly becomes black (N. & N. Rem. 1916).

7. Neosalvarsan is very unstable in the air. 8. An aqueous solution is neutral and on standing gives a dark brown solution and precipitate. 9. **Mineral acids** give precipitates if the solution is not too dilute. 10. Neosalvarsan with **ferric chloride** or **silver nitrate** acts like salvarsan (N. & N. Rem. 1916).

Santonin. — 1. Santonin on exposure to light turns yellow, forming photo-santonic acid and a yellow resinous body (A. D., 1718). 2. With **alkali hydroxides** in solution it forms santoninates, which are soluble in water. 3. An aqueous solution of

santoninate is precipitated by **lead acetate** or **lead subacetate** as lead santoninate. It is also precipitated by **tannic acid, ferrous sulphate, copper sulphate, chlorine water,** and by **acids** if the solution of santoninate is not too dilute. 4. Santonin is turned pink or red by **potassium hydroxide** in the presence of alcohol. 5. Heated with **nitric acid,** santonin forms carbon dioxide, succinic, oxalic, and acetic acids (M. & M., IV. 429). (℞ 379–380.)

Sapo. — 1. Aqueous solutions of soap are decomposed by **mineral acids,** which combine with the base, liberating the free fat acid. 2. Aqueous solutions of **metallic salts** give precipitates of metallic oleates with soaps. 3. Soap is frequently alkaline, and when so it makes a black mixture with **calomel,** due to the mercurous oxide formed. 4. It may precipitate hydroxides or oxides from solutions of metallic salts. (℞ 381–382.)

Sodii Perboras. — 1. Sodium perborate is decomposed by **water,** giving hydrogen dioxide and sodium metaborate. 2. It is also decomposed by catalysers, ferments, and animal tissues. 3. A heat of 60° C. liberates oxygen.

Sodii Thiosulphas. — 1. Sodium thiosulphate (hyposulphite) in aqueous solution is decomposed by nearly all **acids,** forming sulphur, and sulphurous acid. An aqueous solution of the salt slowly forms sulphur and a sulphite. 2. Aqueous solutions of thiosulphates are decomposed into hydrogen sulphide and sulphuric acid when boiled (M. & M., IV. 705). 3. Sodium thiosulphate precipitates, as thiosulphates, solutions of **barium chloride, silver nitrate, lead acetate,** and **mercurous nitrate.** The precipitates are white, but those of the last three salts turn black on standing, forming the sulphide of the metal and sulphuric acid. 4. Sodium thiosulphate with a solution of **ferric chloride** gives a dark violet color, due to ferric thiosulphate. The solution soon loses its color because the salt formed changes to ferrous sulphate. 5. In acid solution sodium hyposulphite reduces **iodine** to hydriodic acid; 6. **chlorates** to chlorine and hydrochloric acid; 7. **chromates** to chromic salts; 8. **permanganates** to manganic salts; 9. **arsenic** compounds to arsenous. 10. Sodium thiosulphate forms soluble double thiosulphates with

many **metallic salts.** 11. Solutions of sodium thiosulphate dissolve **silver iodide, silver bromide, silver chloride, mercuric iodide, lead sulphate, lead iodide,** and other salts (Watts, v. 630). 12. With **calomel** in the presence of moisture it gives a black mixture. 13. In very dilute solutions it prevents the precipitation of some of the alkaloids by **gold chloride.** It combines with the gold to form a double thiosulphate. 14. An acidulated solution bleaches **vegetable colors** on account of its reducing properties. 15. When sodium thiosulphate is triturated with **potassium chlorate, nitrate,** or **permanganate,** or other strong **oxidizing agents,** explosion is liable to take place. 16. **Alcohol** precipitates sodium thiosulphate from an aqueous solution as an oily liquid (N. S. D., 1423). 17. Thiosulphates are generally soluble except lead, silver, mercurous, and barium. (℞ 383–384.)

Sozoiodol, *Diiodoparaphenolsulphonic Acid.* — 1. An aqueous solution of sozoiodol gives a precipitate with **silver nitrate** and **lead acetate.** 2. It gives a violet color with a solution of **ferric chloride.** 3. It precipitates many of the **alkaloidal salts** from aqueous solution. 4. **Oxidizing agents** liberate iodine.

Spiritus. — **Water** causes a separation of the volatile substance from all of the official spirits except spirit of nitrous ether, spirit of ammonia, whiskey, and brandy. They all contain alcohol, and consequently have the reactions of alcohol.

Stovaine. — 1. An aqueous solution of stovaine is slightly acid and is precipitated by **alkaloidal reagents.** 2. It is decomposed by even dilute **alkalies.** 3. A solution of it can be boiled without decomposition.

Strontium. — 1. Salts of strontium in aqueous solution are precipitated by the soluble **carbonates, phosphates,** or **oxalates** as strontium carbonate, phosphate, or oxalate. 2. The soluble **sulphates, chromates,** or **alkali hydroxides** precipitate from concentrated solutions the strontium sulphate, chromate, or hydroxide. (℞ 385.)

Strychnina. — 1. Strychnine combines with **acids** to form salts. 2. Strychnine salts in aqueous solution are precipitated by the reagents mentioned under ALKALOIDS, Nos. 2 and 3.

3. In rather strong solutions of strychnine sulphate the soluble **chlorides, bromides,** and especially the **iodides** are liable to cause precipitation of the strychnine. The precipitation may not take place for several days. In explaining the cause of the trouble several factors must be taken into consideration. Frequently the commercial samples of the alkali iodides and bromides are alkaline from the carbonate which was left in to aid their keeping, and this alkali would liberate and precipitate the strychnine. The compound which potassium iodide forms with strychnine is only sparingly soluble in water, but the corresponding compounds formed with potassium chloride and bromide are more soluble. Some writers partially explain the precipitation by saying that the compounds formed are less soluble in water containing the inorganic salts than they are in water alone. Alcohol tends to prevent the precipitation. 4. **Hydrochloric acid** added to a solution of strychnine hydrochloride gives a crystalline precipitate (M. & M., IV. 517). 5. Alkaline substances like **sodium phosphate, potassium cyanide, sodium arsenate, Fowler's solution,** and **piperazine** will cause a precipitation when added to an aqueous solution of a strychnine salt. 6. Precipitation by **gold chloride** is prevented to some extent by adding to the gold chloride an equal weight of sodium thiosulphate. [See AURI ET SODII CHLORODI, No. 1.] 7. Strong **nitric acid** if hot converts the alkaloid into the yellow explosive compound which is probably the nitrate of nitrostrychnine (Watts, V. 440). 8. One dram of dilute **nitrohydrochloric acid** with seven drams of water containing one fourth of a grain of strychnine sulphate gives a yellow coloration in a few days. In stronger solutions the change takes place more quickly. The chemical products have not been definitely determined. 9. **Potassium permanganate** in alkaline solution yields ammonia, oxalic acid, carbon dioxide, and another crystalline acid, but in acid solution potassium permanganate gives an amorphous acid with strychnine (M. & M., IV. 517). (℞ 386–390.)

Sulphonethylmethanum, *Trional.* — 1. Trional when triturated with **chloral hydrate, euphorin, salol, thymol,** or **urethane** gives a liquid or soft mass. (℞ 391.)

Sulphonmethanum, *Sulphonal.* — 1. Sulphonal is not acted upon by alkalies, acids, or oxidizing agents. 2. It liquefies when triturated with **chloral hydrate.**

Sulphur. — 1. Sulphur readily dissolves in hot aqueous solutions of **hydrates** of **potassium, sodium, barium,** or **calcium,** forming polysulphides and thiosulphates. 2. Triturated dry with strong oxidizing agents, as **potassium chlorate** or **permanganate,** explosion is liable to occur. 3. It combines with many non-metallic elements. (℞ 392.)

Sulphuris Iodidum. — 1. Iodide of sulphur is decomposed by **alcohol, ether, volatile oils,** and solutions of **potassium hydroxide** or **iodide,** the iodide being dissolved by these.

Terebenum. — 1. Terebene on exposure to **air** and **light** resinifies and becomes acid. 2. It combines with **chlorine, bromine,** and **iodine** to form additive products. 3. In many reactions it resembles oil of turpentine.

Theobromina. — 1. Theobromine acts like a weak base, and also like a weak acid. 2. It combines with strong **acids** to form salts that are quite readily decomposed by water. 3. It dissolves in an excess of an **alkali hydroxide** solution. 4. From an aqueous solution, theobromine gives a crystalline precipitate with **silver nitrate, mercuric chloride,** and **gold chloride.** 5. With many of the general **alkaloidal reagents** it gives no precipitate.

Theobrominæ Sodio-Acetas, *Agurin.* — 1. Agurin is readily soluble in water but not in alcohol. The solution is strongly alkaline and the alkalinity causes many incompatibilities. 2. Adding dilute **acids** to not too dilute solutions of agurin gives a precipitate at once or on standing and the precipitate is probably theobromine. 3. In the presence of air and **moisture** it absorbs carbon dioxide and is decomposed and precipitated. 4. A solution of **ferric chloride** with an excess of agurin gives a red brown precipitate. 5. With solutions of **mercuric chloride, lead acetate, tartar emetic, magnesium sulphate** it may give a precipitate at once or on standing. 6. An aqueous solution darkens **calomel** at once. 7. It reduces **potassium permanganate** to some extent. 8. A dilute aqueous solution gives a gelatinous precipitate with **silver nitrate** but the silver is not reduced on standing for several

hours. 9. Excess of tincture of **iodine** causes little or no precipitation at once when added to a solution of agurin, but if the agurin is in excess the iodine is decolorized and a yellowish, gelatinous mass or thick liquid results, which slowly becomes thin again and deposits a white precipitate. 10. It precipitates many **alkaloids** from solutions of their salts. 11. Rubbed with **chloral hydrate, carbolic acid,** or **piperazine** it gives a mass.

Theobrominæ Sodio-Salicylas, *Diuretin.* — 1. Sodio-theobromine salicylate in aqueous solution is strongly alkaline, and is decomposed by **acids,** even the carbon dioxide in the air, with precipitation of probably both theobromine and salicylic acid. 2. **Alkali carbonates** (not hydroxides), **sodium phosphate,** and **borax** slowly give precipitates. 3. Diuretin in excess gives precipitates with solutions of many **metallic salts.** 4. With a solution of **ferric chloride** it gives no precipitate but a violet to red color on account of the salicylate. 5. It reduces salts of silver and mercury. Calomel is darkened at once by diuretin. 6. Tincture of **iodine** is decolor zed at first but added in excess it gives a precipitate. 7. It precipitates some **alkaloids** from solution of their salts. 8. Rubbed with **piperazine** and some solids it gives a mass or liquid. [See page 270.] 9. It has the incompatibilities of a salicylate, theobromine, and an alkali. (℞ 394.)

Thiol. — Thiol is precipitated from its aqueous solutions by **alkali hydroxides, mineral acids,** and **metallic salts.**

Thiosinamine. — 1. It is moderately soluble in water but is decomposed by **water.** Glycerin prevents this decomposition to a limited extent (N. & N. Rem. 1916). 2. **Antipyrine** aids its solution (Scoville, 74).

Thymol. — 1. Thymol unites with **alkalies** to form soluble salts (U. S. D.). 2. A solution of thymol with **iodine** and potassium hydroxide gives a red amorphous precipitate of iodothymol (M. & M., IV. 715). 3. **Spirit of nitrous ether** gives a green and then a brown color, changing the thymol to nitroso-thymol. 4. Thymol absorbs **ammonia-gas** and becomes liquid (M. & M., IV. 715). 5. Thymol reduces **gold** and **platinum** from solutions of their salts. 6. **Chromic acid** oxidizes thymol to thymoquinone (M. & M., IV. 715). 7. Thymol gives a liquid or soft mass when

rubbed with aristochin, quinine sulphate, trional, and other solids. [See page 270.] (℞ 395–396.)

Thymolis Iodidum, *Aristol.* — 1. Aristol is decomposed by **light** and **heat,** more quickly if dissolved in ether. 2. It should not be prescribed with bodies that have a strong affinity for iodine, as **oxides, hydroxides, carbonates, starch,** or **mercury salts.** 3. **Oxidizing agents** liberate iodine.

Tragacantha. — 1. Tragacanth is colored yellow by a solution of **sodium hydroxide** (Allen 1. 428). 2. An aqueous mixture is thickened by **alcohol,** and by **neutral** and **basic lead acetate** (not coagulated by borax, silicates, or ferric salts) (Allen, 1. 428). 3. With water and **bismuth subnitrate** it forms masses.

Urea. — Urea becomes soft or liquid when triturated with some solids. [See page 270.]

Veronal. — 1. Veronal forms salts with **alkalies** (N. & N. Rem. 1916). 2. Heating with **alkalies** or **sodium carbonate** decomposes it, liberating ammonia. 3. It darkens **calomel.**

Zinci Chloridum. — Zinc chloride, like gold and mercuric chlorides, has a strong tendency to combine with **organic bases,** as strychnine, morphine, and quinine (U. S. D.). [See Zincum and Acidum Hydrochloricum.] (℞ 398.)

Zinci Iodidum. — 1. Commercial zinc iodide frequently does not give a clear solution with water. It is quite distinctly alkaline to litmus and may give a further precipitate when mixed with a solution of zinc chloride.

Zincum. — 1. Zinc salts in aqueous solutions are precipitated by the fixed **alkali hydroxides** or **lime water** as zinc hydroxide which is soluble in excess of the alkali hydroxide. 2. Zinc salts are precipitated by soluble **carbonates, phosphates, arsenates,** or **cyanides,** as the basic carbonate, phosphate, arsenate, or cyanide. 3. **Borax** gives a precipitate of zinc borate or a mixture of the borate and hydroxide. 4. **Tannic acid** gives a precipitate with concentrated solutions of zinc salts. 5. Zinc salts coagulate **albumin.** (℞ 397–400.)

PART II

PRESCRIPTIONS WITH CRITICISMS

In studying the following prescriptions the student should try to make out for himself, so far as possible, wherein the trouble lies, and what he would do to prevent or remedy it, before referring to the notes. In order not to overlook any of the incompatibilities it is suggested that he find out what effect, if any, the first ingredient may have on each of the others; then the second ingredient, the third, and so on. Then, taking the prescription as a whole, he should determine the color that will be produced, the nature and color of the precipitate, how one incompatibility will be modified by another, etc. The student should practice translating the Latin into English, and the English into Latin. The majority of prescriptions which follow should be filled, unless in the reaction there is some more active or dangerous compound formed. It must not be forgotten that a variation in the proportions of ingredients modifies the results of combination.

1.

℞

Acidi borici,	ʒ j
Sodii boratis,	ʒ ij
Mucil. acaciæ,	f. ℥ iij
Aq. menth. piper.,	q. s. ad f. ℥ iv

Misce. Sig.: Teaspoonful two hours after meals.

2.

℞

Olei morrhuæ,	f. ʒ iv
Acaciæ,	ʒ j
Syrupi tolutani,	f. ʒ iv
Sodii boratis,	gr. xv
Aquæ,	q. s. ad f. ℥ ij

M. S. Teaspoonful three times a day.

3.

℞

Liq. plumbi subacet.,	f. ʒ ss
Muc. acaciæ,	f. ℥ j
Aq. destil.,	q. s. ad f. ℥ iv

M. Ft. lotio.

4.

℞

Tincturæ guaiaci,	
Muc. acaciæ,	aa. f. ℥ j

M. S. Teaspoonful every three hours.

5.

℞

Copaiba,	f. ʒ vj
Sp. nit. ether,	f. ℥ ij
Co. tr. lavender,	f. ʒ ij
Acacia,	ʒ iv
Water,	to make f. ℥ iv

M. Tablespoonful three times daily.

6.

℞
Tincturæ ferri chloridi, f. ʒ ij
Spiritus ætheris nitrosi, f. ʒ iv
Mucilaginis acaciæ, f. ℥ j
Syrupi, q. s. ad f. ℥ iij
M. S. Teaspoonful three times a day.

7.

℞
Liquoris ferri dialysati, f. ʒ iv
Syrupi, f. ℥ j
Mucilaginis acaciæ, f. ʒ iv
Misce.

8.

℞
Hydrarg. chlor. cor., gr. iij
Muc. acaciæ, ℥ j
Aquæ,
Liquoris calcis, aa. ℥ ij
M.

9.

℞
Carbolic acid cryst., gr. c
Gum arabic, ℥ ss
Benzoin,
Balsam of tolu, aa. gr. x
Essence of cinnamon, ♏ v
Saccharin, gr. v
Alcohol, to make f. ℥ ij
Mix and make a solution.

10.

℞
Acetanilid, gr. xxx
Spirit of nitrous ether,
Syrup, aa. f. ℥ j
Mix and label: Teaspoonful every hour until fever subsides.

11.

℞
Acetanilid, ʒ ij
Tinct. of ferric chloride, f. ʒ v
Water, enough to make f. ℥ iv
Make solution with the aid of heat.
Label: Teaspoonful three times a day.

12.

℞
Antipyrine,
Acetanilid, aa. 2 Gm.
Resorcin, 3 Gm.
Water, 100 Cc.
Mix. Label: Teaspoonful every hour until the fever begins to subside.

13.

℞
Tincture of aconite, ♏ xx
Phenacetin, gr. xl
Spirit of nitrous ether, f. ʒ v
Syrup, f. ʒ iij
Water, f. ℥ ij
Mix and label: Teaspoonful every two hours until the fever subsides.

14.

℞
Phenacetin, gr. xv
Tincture ferric chloride, f. ʒ ij
Water, enough to make f. ℥ ij
Mix and label: Teaspoonful twice a day.

15.

℞
Codeine sulphate, gr. viij
Phenacetin, ʒ j
Ammon. chlor., ʒ jss
Sodium bromide, ʒ iv
Glycerin,
Mucilage of acacia, aa. f. ʒ iij
Water, q. s. ad f. ℥ ij
Mix. Teaspoonful in water every 1, 2, 3, or 4 hours as needed.

16.

℞
Liquoris ammonii acet., 30 Cc.
Tinct. ferri chloridi, 15 Cc.
Syrupi, q. s. ad 60 Cc.
Misce.

17.

℞
Quininæ sulph., gr. x
Potassii acetatis, gr. xx
Acidi sulphurici dil., gtt. iv
Aquæ cinnamomi, q. s. ad f. ℥ j
M. S. Teaspoonful after meals.

18.

℞
Potass. acetatis, ʒ ss
Spiritus ætheris nit., f. ʒ ij
Aquæ, q. s. ad f. ℥ j
M. S. Take in two doses one hour apart.

19.

℞
Quinine sulphate,
Aspirin, aa. grs. xxx
Mix. Make caps. No. xx

20.

℞
Acetylsalicylic acid, ʒ iss
Potass. iodide, gr. xxiv
Make 12 cachets. Sig.: One three times a day.

21.

℞
Potass. citrate, ʒ iij
Aspirin, gr. lxxx
Spirit of chloroform, f. ʒ ij
Syrup, f. ℥ j
Peppermint water, to make, f. ℥ viij
Mix. Label: Dessertspoonful every two hours until relieved.

22.

℞
Benzoic acid,
Salicylic acid, aa. gr. iij
Cocaine hydrochloride, gr. v
Distilled water, f. ℥ j
Mix and make solution by aid of water-bath.
Label: Apply locally.

23.

℞
Quinine sulphate, gr. xv
Sodium benzoate, gr. x
Aromat. sulphuric acid, ♏ x
Elixir, enough to make f. ℥ j
Mix. Label: One half teaspoonful three times a day.

24.

℞
Ammonium benzoate, ʒ ij
Citrated caffeine, ʒ ss
Iron and quinine cit., ʒ ij
Water, to make f. ℥ vj
Make a mixture. Label: Teaspoonful three times a day.

25.

℞
Hydrargyri chlor. cor., gr. xx
Sodii boratis, ʒ ij
Aquæ destil., ℥ iv
Fiat lotio. Sæpe utenda.

26.

℞
Plumbi acetatis,
Sodii boratis, aa. 1 Gm.
Glycerini, 20 Cc.
Aquæ, 80 Cc.
M. S. Apply as directed.

27.

℞
Borax,
Zinc sulphate, aa. ʒ ss
Mix. Dissolve one teaspoonful in cup of water.

28.

℞
Magnesii carbon., ʒ iss
Sodii boratis,
Acidi citrici, aa. ʒ ij
Aquæ bullientis, q. s. ad f. ℥ viij
M. S. Tablespoonful in the morning before breakfast.

29.

℞
Fl. ext. hydrastis colorless, f. ℥ j
Sodium bicarbonate,
Bismuth subnitrate, aa. ℥ ss
Borax, ʒ ij
Honey, f. ℥ ss
Peppermint water, to make f. ℥ vj
Mix. Label: Shake well. Teaspoonful before meals.

30.

℞
Hydrastine sulphate, gr. j
Boracic acid,
Borax, aa. gr. vij
Tinct. of opium, gtt. xx
Water, f. ℥ j
Mix. Mark: Put 2 drops in each eye two or three times a day.

31.

℞
Cocaine hydrochlor., gr. iv
Boric acid, gr. x
Salicylic acid, gr. j
Water, f. ℥ j
Mix. Label: Eye water.

32.

℞
Cocainæ hydrochlor., gr. v.
Sodii boratis, gr. ij
Aquæ dest., ℥ j
M. S. Drop one drop in right eye at night.

33.

℞
Sodii boratis, ʒ ij
Chlorali hydrati, ʒ j
Alcoholis, f. ℥ ss
Aquæ, q. s. ad f. ℥ vj
Misce et fiat lotio.

34.

℞
Spiritus ætheris nit., f. ℥ j
Potassii citratis, ʒ ij
Syrupi, f. ℥ j
M. S. Capiat cochleare parvum post prandium.

35.

℞
Quininæ sulph., ℈ ij
Potassii citratis, ʒ ij
Acidi citrici, ʒ j
Aquæ, q. s. ad f. ℥ vj
M. S. Cochleare medium post cibum.

36.

℞
Cocaine hydrochloride, gr. v
Gallic acid, gr. x
Oxide of zinc ointment, ʒ iv
Vaseline, to make ℥ j
Mix. Label: Apply locally.

37.

℞
Hydrargyri chloridi cor., gr. ij
Potassii iodidi, ʒ ij
Syrupi rhei aromatici, f. ℥ iv
Elixiris cinchonæ, f. ℥ iv
Misce et signa: Teaspoonful three times a day.

38.

℞
Hydrargyri chloridi cor., gr. ¼
Sodii iodidi,
Ammonii iodidi, aa. ʒ ij
Potassii chloratis, ʒ j
Aquæ, f. ℥ j
Syrupi sarsaparillæ co., f. ℥ iv
M. S. Teaspoonful in wineglass of water after each meal.

39.

℞
Hydrargyri chlor. mit., gr. vj
Potassii iodidi, gr. xl
Misce et fiat pulvis et in chartulas decem divide.
Signa: One powder after each meal.

40.

℞
Tinct. ferri chlor., f. ℥ j
Tinct. iodi,
Liq. pot. arsenit.,
Ac. phosphor. dil., aa. f. ʒ iv
Quininæ sulph., ʒ j
Rhei pulv., ℥ ss
Aquæ, q. s. ad f. ℥ viij
Misce. Sig. Teaspoonful after meals.

41.

℞
Potassii iodidi, ʒ ij
Spiritus ætheris nit., f. ℥ j
Tinct. ferri chloridi, f. ʒ iss
Tinct. gentianæ co., f. ℥ iss
Glycerini, f. ℥ ss
Aquæ, q. s. ad f. ℥ iv
M. S. Teaspoonful three times a day before meals.

42.

℞
Potass. chloratis, ʒ ij
Syr. ferri iodidi, ℥ ss
Quininæ sulph., ℈ j
Ac. sulphurici dil., ♏ xx
Aquæ, q. s. ad ℥ ij
M. S. Teaspoonful after each meal.

43.

℞
Liq. sodii arsenatis, ʒ ij
Potassii iodidi, gr. xl
Quininæ sulph., ʒ j
Acidi sulph. dil., f. ʒ j
Aquæ, q. s. ad f. ℥ iij
M. S. Teaspoonful twice a day.

44.

℞
Potassium iodide,
Fowler's solution, aa. ℥ ss
Mix. Take five drops in a little water three times a day.

45.

℞
Magendie's solution of morphine, f. ʒ ij
Sat. solut. potass. iodide, f. ʒ vj
Label: Take ten drops three times a day.

46.

℞
Quininæ sulphatis,
Acidi tartarici,
Potassii iodidi, aa. gr. xij
Aquæ, q. s. ad f. ℥ ij
Misce. Signa: Cochleare parvum bis vel ter in die sumatur.

47.

℞
Quininæ sulphatis,
Potassii iodidi, aa. gr. vij
Ac. nitrohydrochlorici, ♏ xx
Aquæ, q. s. ad f. ℥ ij
M. S. Teaspoonful after meals.

48.

℞
Quininæ sulphatis, ʒ ss
Potassii iodidi, ʒ j
Strychninæ sulph., gr. v
Tinct. cardam. co.,
Syr. zingiber., aa. f. ℥ ij
Aquæ fontanæ, q. s. ad O. ss
M. S. Take one tablespoonful night and morning.

49.

℞
Potassii iodidi, ʒ ij
Spiritus ætheris nit., ℥ j
Liq. ammonii acet., ℥ ij
Sodii citratis, ʒ j
Aquæ, q. s. ad f. ℥ vj
M. S. Teaspoonful three times a day.

50.

℞

Liq. arseni et hydrarg. iodidi,	10 Cc.
Potassii iodidi,	5 Gm.
Quininæ sulphatis,	2 Gm.
Acidi sulphurici aromat.,	q. s.
Syrupi,	q. s. ad 300 Cc.

M. S. 4 Cc. after each meal.

51.

℞

Potassii bromidi,	gr. xv
Hydrargyri chlor. mitis,	gr. v

Misce et fiat pulvis; mitte tales No. XII.

52.

℞

Strychninæ sulph.,	gr. ss
Potassii bromidi,	ʒ iij
Aquæ,	q. s. ad f. ℥ iv

Misce et signa: Teaspoonful three times a day.

53.

℞

Acetphenetidin,	ʒ ss
Tinct. gelsemium,	f. ʒ ss
Citrated caffeine,	gr. xij
Sodium bromide,	ʒ ss

Mix. Make 12 capsules.

54.

℞

Silver nitrate,	1.5 Gm.
Sodium chloride,	0.6 Gm.
Water,	200 Cc.

Mix. Label: Use as an eyewash.

55.

℞

Acidi hyd. dil.,	20 Cc.
Aquæ,	100 Cc.

M. Sig. Teaspoonful in water after meals.

56.

℞

Acidi hydrocyanici dil.,	♏ xxx
Sodii bicarbonatis,	℈ iv
Syrupi,	q. s. ad ℥ ij

M. S. Teaspoonful three times a day.

57.

℞

Potassii cyanidi,	gr. iss
Hydrarg. chlor. mitis,	gr. xxiv

Tragacanthæ,
Aquæ, aa. quantum requiritur ut fiat massa in pilulas triginta formanda.

Signa: Capiat pilulas duas omni nocte.

58.

℞

Potassii cyanidi,	ʒ j
Morphinæ acet.,	gr. ij
Acid' acetici,	gtt. ij
Syrupi,	q. s. ad f. ℥ viij

M. S. Cochleare parvum ter in die.

59.

℞

Strychninæ sulph.,	
Potassii cyanidi,	aa. gr. ss
Aquæ,	q. s. ad f. ℥ ij

M. S. Teaspoonful night and morning.

60.

℞

Codeine,	gr. ij
Dil. phosphoric acid,	q. s.
Dil. hydrocyanic acid,	♏ xx
Tincture of iodine,	♏ x
Water,	enough to make f. ℥ iv

Mix. Label: Tablespoonful at night.

61.

℞

Calcii hypophosphitis,	ʒ j
Aquæ,	f. ℥ ij
Tinct. ferri chlor.,	f. ʒ iv
Morph. sulphatis,	gr. iv
Syrupi tolutani,	f. ℥ ij

M. S. Teaspoonful three times a day.

62.

℞
Pot. chlorat.,
Calc. hypophosphit., aa. gr. xv
Magnesii sulphatis, gr. xxx
Ferri sulphatis, gr. vj
Liq. strychninæ, ♏ xx
Aquæ, q. s. ad f. ℥ iij
Misce et signa: Teaspoonful three times a day.

63.

℞
Calcii hypophosphitis, gr. xv
Hydrarg. chlor. cor., gr. ss
Syr. sarsaparil. co., f. ℥ ij
M. S. Teaspoonful two or three times a day.

64.

℞
Strych. sulph., gr. ½
Bis. subnitrate, ℈ j
Pepsin, ℈ j
Dil. hydrochlor. ac., ♏ xx
Syr. hypophosphites, f. ℥ j
Water, to make f. ℥ ij
Mix. Label: Teaspoonful three times a day.

65.

℞
Bismuthi subnitratis, ʒ ij
Sodii hypophosphitis, ʒ j
Extracti nucis vomicæ, gr. v
Misce, fiat pulvis et divide in partes æquales No. xxv.

66.

℞
Calcii hypophosphitis, 2.5 Gm.
Ferri lactatis, .3 Gm.
Potassii chloratis, 4.0 Gm.
M. Ft. pil. No. xxx.

67.

℞
Sodium oleate, acid,
Salicylic acid,
Phenolphthalein, aa. ʒ j
Menthol, gr. v
Mix. Make 30 capsules.
Label: One capsule t. i. d. followed by a glass of hot water.

68.

℞
Acidi phosphorici, f. ʒ ij
Acidi nitrici, f. ʒ v
Tinct. ferri chlor., f. ℥ ij
Mix.

69.

℞
Chloroformi,
Acidi nitrici,
Creosoti, aa. f. ʒ ij
M. S. For cauterizing.

70.

℞
Acidi sulphurici, f. ʒ j
Acidi nitrici, f. ʒ j
Olei terebinthinæ, f. ℥ ss
Alcoholis, f. ʒ ij
M. S. Caustic.

71.

℞
Dil. nitrohydrochlor. ac., f. ʒ v
Comp. syr. hypophosphites, q. s. f. ℥ iij
M. Label: Teaspoonful three times daily in a wineglass of water before meals.

72.

℞
Acidi nitrohydrochlorici, ʒ vij
Spiritus terebinthinæ, ℥ j
Make emulsion, ℥ iv
Sig. Teaspoonful three times a day.

73.

℞
Strychnine sulph., gr. ss
Dil. nitrohydrochlor. acid, ʒ ij
Water, to make ℥ j
Mix. Label: Thirty drops after meals.

74.

℞
Tinct. nucis vom.,
Acidi nitromur., aa. f. ʒ ij
Elixiris cinchonæ co., N. F., f. ℥ iiiss
M. S. Teaspoonful in an ounce of water after meals.

75.

℞
Fluidextract nux vomica, ♏ xl
Fluidextract digitalis, ʒ iss
Tinct. strophanthus, ℥ ss
Potassium nitrite, ʒ viss
El. gen. and iron, to make ℥ vj
Mix. Label: Teaspoonful three times a day.

76.

℞
Bichloride of mercury, gr. x
Spirit of nitrous ether,
Dilute alcohol, of each f. ℥ j
Mix. Label: Apply externally.

77.

℞
Syrupi scillæ,
Syrupi ipecac., aa. f. ʒ j
Syrupi eriodictyi arom., f. ʒ ij
Potassii iodidi, ℈ j
Spiritus ætheris nit., f. ʒ ij
Glycerini, f. ʒ iv
Syrupi acidi citrici, q. s. ad f. ℥ iij
Misce. Signa: Teaspoonful when coughing.

78.

℞
Fluidextracti buchu, f. ℥ ss
Spiritus ætheris nitrosi, f. ℥ j
Potassii acetatis, ʒ ij
Syrupi, q. s. ad f. ℥ iv
Misce et signa: Teaspoonful half hour after meals.

79.

℞
Potassii citratis, ʒ vj
Potassii bicarbonatis, ʒ iij
Liquoris pot. hydrox., f. ʒ ij
Fluidextracti buchu, f. ʒ vj
Spiritus ætheris nitrosi, f. ʒ iv
Syrupi limonis, q. s. ad f. ℥ vj
M. S. Tablespoonful three times a day.

80.

℞
Sodium salicylate, gr. x
Ammonium carbonate, gr. iij
Sp. of nitrous ether,
Sp. of chloroform, aa. ♏ x
Water, enough to make ʒ j
Mix.

81.

℞
Antipyrine, ʒ j
Sp. of nitrous ether, f. ʒ j
Tincture of aconite, gtt. xx
Elixir, enough to make f. ℥ ij
Mix.

82.

℞
Resorcin, 10 Gm.
Glycerin, 15 Gm.
Spirit of nitrous ether,, 10 Cc.
Water, 35 Cc.
Mix.

83.

℞
Sp. ætheris nitrosi,
Tincturæ guaiaci, aa. f. ℥ j
Tincturæ colchici, f. ʒ iv
Syrupi, f. ℥ iij
M.

84.

℞

Tinct. digitalis, f. ʒ ij
Tinct. ferri chloridi, f. ʒ iss
Acidi phosphorici diluti, f. ʒ j
Aquæ, q. s. ad f. ℥ ij

M. S. Teaspoonful in some water twice a day.

85.

℞

Ferri et quin. cit., ʒ j
Ac. phosphor. dil., f. ʒ j
Tinct. cardamomi co., f. ʒ iij
Syr. limonis, f. ʒ ij
Aquæ, q. s. ad f. ℥ ij

M. S. Teaspoonful twice a day.

86.

℞

Quinine sulphate, ʒ j
Strychnine sulphate, gr. j
Phosphoric acid dil., f. ʒ iv
Tinct. chloride of iron, f. ʒ v
Aromatic elixir, to make f. ℥ iv

Mix. Label: Take a teaspoonful after meals.

87.

℞

Sodii phosphatis, ʒ v
Syrupi rhei, f. ʒ iv
Syrupi, f. ℥ ss
Aquæ, q. s. ad ℥ ij

M. S. Teaspoonful in a little water before meals.

88.

℞

Sodii phosphatis, gr. xxx
Strychninæ sulph., gr. ss
Syr. aurantii corticis, ℥ ij

M. S. Teaspoonful three times a day.

89.

℞

Sod. phos., ℥ ij
Pot. bicarb., ʒ ij

Mix and label: Two teaspoonfuls at night.

90.

℞

Sodium salicylate, gr. clx
Potassium bicarb., gr. clx
Tinct. chlor. iron, ♏ clx
Water, to make f. ℥ viij

Mix. Label: Teaspoonful three times a day.

91.

℞

Salicylic acid, ʒ ij
Pyrophosphate of iron, sol., ʒ j
Sod. phosphate, ʒ j
Water, to make, f. ℥ vj

Mix. Label: Teaspoonful every two hours.

92.

℞

Lithii salicylatis, ʒ ij
Ferri et ammon. cit., ʒ iv
Syr. limonis,
Aquæ, aa. f. ℥ iv

M.

93.

℞

Tinct. iodi comp., f. ʒ ij
Acidi salicylici, ʒ j
Glycerini, f. ℥ iss
Aquæ, enough to make f. ℥ iv

Mix and label: Paint over the affected part several times a day.

94.

℞

Sodii salicylatis, gr. xxx
Spiritus ætheris nitrosi, ♏ xxx
Aquæ, f. ℥ ij

Misce. Signa: Cochleare medium ter quotidie.

95.

℞

Antipyrine,
Sodium salicylate, aa. gr. xxx

Mix and make 15 powders.

96.

℞

Sodii salicylatis,	gr. xx
Quininæ sulphatis,	gr. xx
Syrupi zingiberis,	f. ℥ ij

M. S. Teaspoonful doses.

97.

℞

Sodii salicylatis,	ʒ iiss
Syrupi limonis,	f. ℥ ij

M. S. Teaspoonful three times a day.

98.

℞

Acidi salicylici,	
Sodii bicarbonatis,	aa. ℥ j
Aquae,	q. s. ad f. ℥ vj

M. Ft. sol.
Sig. ʒ j t. i. d.

99.

℞

Acidi salicylici,	ʒ j
Glycerini,	ʒ ij
Aquæ dest.,	℥ iij

Misce et fiat sol.
Signa: Teaspoonful every hour.

100.

℞

Strychnine sulph.,	gr. j
Arsenous acid,	gr. $\frac{2}{3}$
Mass carb. of iron,	gr. l
Sulphuric acid aromat.,	gtt. iij
Quinine sulphate,	gr. xx

Mix and divide into 20 pills.

101.

℞

Rochelle salt,	ʒ iv
Elixir of vitriol,	f. ʒ ij
Camphor water,	to make f. ℥ iij

Mix and label: One ounce, to be repeated if necessary.

102.

℞

Raw linseed oil,	f. ℥ viij
Potassium nitrate,	
Lead acetate,	
Sulphuric acid,	aa. ℥ ss
Carbolic acid,	ʒ ij

Mix and label: Caustic.

103.

℞

Acidi sulphurici conc.,	℥ ss
Picis liquidæ,	℥ iv
Potassii bichromatis,	ʒ iij

Misce caute.
Signa: Caustic for horse.

104.

℞

Quininæ sulph.,	gr. xvj
Aquæ,	f. ʒ ij
Acidi sulphurici dil.,	q. s.
Fluidextracti glycyrrhizæ,	q. s. ad f. ℥ ij

M. et ft. mist.

105.

℞

Tinct. ferri chloridi,	f. ℥ ss
Acidi sulphurosi,	f. ʒ ij
Potassii chloratis,	ʒ ij
Glycerini,	f. ℥ j
Aquæ,	q. s. ad f. ℥ vj

Misce. Signa: Use with atomizer.

106.

℞

Potassii chloratis,	ʒ j
Acidi sulphurosi,	f. ʒ iv
Glycerini,	f. ʒ iij
Aquæ,	f. ℥ j

M. S. Mix one teaspoonful with a glass of water and use as a gargle.

107.

℞

Sodii hypophosphitis,	gr. xx
Acidi sulphurosi,	f. ʒ j
Aquæ cinnamomi,	q. s. ad f. ℥ ij

M. S. Teaspoonful for vomiting.

108.

℞

Sodii sulphitis,	ʒ ij
Sp. ætheris nit.	f. ℥ ss
Liq. ammon. acet.,	f. ℥ ss
Aquæ dist.,	f. ℥ ij

M. S. Tablespoonful every two or three hours.

109.

℞

Potassium chlorate,	
Boric acid,	aa. ʒ j
Tannic acid,	ʒ ss
Water,	to make f. ℥ vj

Mix. Label: Gargle.

110.

℞

Plumbi subacetatis,	ʒ ss
Zinci sulphatis,	gr. xl
Tinct. catechu co.,	
Tincturæ opii,	aa. f. ℥ ss
Aquæ,	q. s. ad f. ℥ viij

M. S. Injection. Shake well before using.

111.

℞

Ferri sulphatis,	gr. xxx
Acidi tannici,	gr. x
Syrupi,	f. ℥ j
Aquæ,	f. ℥ ij

M. S. Teaspoonful every two hours.

112.

℞

Tannic acid,	gr. x
Zinc sulphate,	gr. xxx
Bismuth subnit.,	ʒ j
Morphine muriate,	gr. vj
Sol. lead subacet.,	f. ʒ iv
Water,	to make f. ℥ iij

M. S. Use locally 4 or 5 times daily.

113.

℞

Acidi tannici,	gr. xv
Tincturæ iodi,	f. ʒ j
Glycerini,	f. ʒ ij
Aquæ,	f. ʒ v

M. S. Apply twice a day.

114.

℞

Sodium salicylate,	
Sodium benzoate,	aa. ʒ j
Tannic acid,	gr. x
Carbolic acid, liq.	gtt. xij
Lime water,	f. ℥ iv

Mix. Label: Teaspoonful half hour after meals.

115.

℞

Quinine bisulph.,	gr. xx
Tincture of gambir co.,	f. ʒ iij
Water,	enough to make f. ℥ iij

Mix. Mark: Teaspoonful every hour.

116.

℞

Menthol,	gr. v
Cocaine,	gr. iij
Tannic acid,	gr. x
Liquid petrolatum,	f. ℥ j

Mix. Label: Spray for nose.

117.

℞

Tinct. myrrhæ,	f. ʒ ij
Morph. acetatis,	gr. ij
Acidi tannici,	ʒ ss
Syr. zingiberis,	f. ℥ iss

Misce et fiat sol.

Sig. Teaspoonful at 6, 8, and 10 o'clock P.M.

118.

℞

Quininæ sulph.,	ʒ j
Morphinæ sulph.,	gr. iij
Strychninæ sulph.,	gr. ⅜
Acidi arsenosi,	gr. 1⅛
Ext. belladonnæ,	gr. v
Aconitinæ,	gr. ij
Ferri bromidi,	℈ j

M. Ft. pil. No. xxiv.

119.

℞

Solution adrenalin chloride, f. ʒ j
Chloretone, ʒ ss
Milk of magnesia, to make f. ℥ ij
Mix. Label: One dram every two hours until relieved.

120.

℞

Hydrargyri chloridi cor., gr. iij
Albuminis, ʒ iss
Aquæ, q. s. ad f. ℥ x
Misce et cola.
Signa: Teaspoonful three times a day.

121.

℞

Potassii nitratis,
Sodii chloridi,
Camphoræ, aa. 3 Gm.
Tincturæ opii,
Aquæ, aa. 15 Cc.
Alcoholis, q. s. ad 120 Cc.
M. S. Apply with friction.

122.

℞

Aloin, ʒ iij
Tr. nux vomica, f. ʒ j
Tr. ginger, f. ℥ ij
Sp. nitrous ether, f. ℥ ij
Water, to make O. j
Mix. Label: Give at one drench.

123.

℞

Sugar of lead, ʒ ss
Alum, gr. xv
Rose water, f. ℥ iv
Mix and label: Lotion.

124.

℞

Alumnol,
Resorcin, aa. ʒ ij
Water, to make f. ℥ viij
Make solution. Apply locally.

125.

℞

Plumbi acetatis,
Ammonii carbonatis, aa. ʒ j
Aquæ rosæ, f. ℥ viij
Fiat lotio. Signa: Apply on lint to allay irritation.

126.

℞

Heroine hydrochlor., gr. vj
Corrosive sublimate, gr. ij
Sol. potas. arsenite, f. ʒ ij
Ammon. carb., ʒ j
Muc. acacia, q. s. f. ℥ iv
M. Teaspoonful in a little water every four hours.

127.

℞

Ammonii carbonatis, ʒ iiss
Syrupi tolutani,
Syrupi scillæ, aa. f. ℥ ij
Misce et fiat solutio.
Sig. Teaspoonful when coughing.

128.

℞

Guaiacol, ʒ ij
Acacia, ʒ ij
Ammon. carbonate, ʒ iij
Infusion digitalis, f. ℥ iss
Water, to make f. ℥ iij
Mix. Label: Teaspoonful four times a day.

129.

℞

Amylis nitritis, f. ʒ j
Alcoholis, f. ℥ j
Potassii iodidi, ʒ j
Syrupi limonis, q. s. ad f. ℥ ij
Misce. Cito dispensetur!
Signetur: A teaspoonful to be taken every hour.

130.

℞

Ichthyol,	ʒ j
Zinc oxide,	ʒ ij
Prepared chalk,	
Starch,	
Linseed oil,	aa. f. ʒ iij
Lime water,	f. ʒ iv

Mix. Apply on lint to a burn.

131.

℞

Mercuric chloride,	gr. j
Tartar emetic,	gr. v
Syrup of squills,	f. ℥ ij

Mix and label: Half teaspoonful as directed.

132.

℞

Balsam Peru,	ʒ v
Betanaphthol,	grs. xxx
Sulphur oint.,	℥ j
Petrolatum,	q. s. ad ℥ ij

Mix. Make oint.

133.

℞

Syr. ferri iodidi,	f. ℥ j
Antipyrinæ,	ʒ ij
Syrupi,	f. ℥ j

M. S. Teaspoonful as directed.

134.

℞

Antipyrine,	gr. lx
Sodium salicylate,	ʒ iij
Magnesium sulphate,	℥ j
Water,	to make f. ℥ viij

Mix.

135.

℞

Potassii bromidi,	gr. x
Antipyrinæ,	gr. v
Tinct. ferri chloridi,	♏ x
Spiritus chloroformi,	♏ x
Aquæ,	q. s. ad f. ℥ j

M. S. Teaspoonful twice a day.

136.

℞

Antipyrine,	gr. x
Quinine sulphate,	gr. j
Dil. sulphuric acid,	q. s.
Cinnamon water,	to make f. ℥ j

Mix. Take in two doses one hour apart.

137.

℞

Antipyrine,	ʒ j
Borax,	ʒ iiss
Phenol,	ʒ j
Chloral hydrate,	ʒ iss
Glycerin,	f. ʒ j
Water,	to make f. ℥ viij

Mix. Label: Apply as directed.

138.

℞

Fluidextracti gelsemii,	f. ʒ ss
Fluidext. can. ind.,	gtt. xviij
Chlorali hydrati,	ʒ iss
Antipyrinæ,	ʒ j
Aquæ puræ,	f. ℥ j

M. S. One teaspoonful every four hours.

139.

℞

Sodium bromide,	gr. xl
Antipyrine,	gr. xxvj
Camphor,	gr. iv
Caffeine citrate,	gr. vj
Tinct. aconite,	gtt. xij

Mix and make twelve capsules.

Label: One capsule every three or four hours.

140.

℞

Apomorph. hydrochlor.,	gr. j
Liq. ammon. acet.,	f. ℥ j
Sp. ætheris nit.,	f. ℥ ss
Vin. ipecac.,	f. ℥ ij
Aquæ,	q. s. ad f. ℥ vj

M. S. Teaspoonful every two hours.

141.

℞

Tinct. ferri chlor.,	f. ℥ ss
Glycerini,	f. ℥ iss
Aquæ ammoniæ,	f. ʒ iij
Aquæ,	q. s. ad f. ℥ iv

Mix and make a solution.

142.

℞

Tincturæ aconiti,	f. ʒ j
Tincturæ iodi,	f. ʒ ij
Linimenti saponis,	
Aquæ ammoniæ,	aa. f. ℥ ij

M. S. Embrocation.

143.

℞

Tinct. digitalis,	f. ʒ ij
Sp. ammon. arom.,	f. ʒ iij
Strychninæ sulph.,	gr. ss
Elix. calisayæ,	ad. f. ℥ vj

Misce et signa: Cochleare parvum ter in die.

144.

℞

Potassii bromidi,	ʒ vj
Aquæ camphoræ,	f. ℥ vj

M. S. Dessertspoonful before retiring at night.

145.

℞

Potassii bichromatis,	gr. x
Ferri sulphatis,	ʒ iss
Liq. hydrogenii dioxidi,	
Glycerini,	aa. f. ℥ j
Aquæ dest.,	q. s. ad f. ℥ iv

M. S. Lotion.

146.

℞

Liquoris hydrogenii diox.,	f. ℥ j
Potassii permangan.,	gr. xx
Aquæ,	f. ℥ j

Misceatur conquassando.

Signetur: Pars affecta fricetur nocte maneque.

147.

℞

Bismuth subsalicylate,	ʒ ij
Tannic acid,	ʒ iij
Sol. hydrogen peroxide,	f. ℥ vii

Mix. Label: Inject three times daily.

148.

℞

Liq. hydrogenii dioxidi,	f. ℥ j
Zinci sulphatis,	ʒ vj
Acidi carbolici,	ʒ j
Glycerini,	f. ℥ j
Aquæ,	q. s. ad f. ℥ viij

Misce et fiat lotio.

Signa: Apply locally.

149.

℞

Argenti nitratis,	ʒ j
Glycerini,	f. ʒ ij
Aquæ dist.,	f. ʒ j

Mix and mark No. 1.

Label: Mix three drops with six drops of No. 2 and put into eyes at bedtime.

℞

Potassii iodidi,	ʒ ij
Glycerini,	f. ʒ iv
Aquæ dist.,	f. ʒ ij

Mix and mark No. 2.

Label: Mix six drops with three drops of No. 1 and put into eyes at bedtime.

150.

℞

Argenti nitratis,	gr. vj
Liquoris Fowleri,	f. ʒ j
Aquæ,	q. s. ad f. ℥ iv

M. S. Teaspoonful twice a day.

151.

℞

Sodium phosphate,	ʒ ij
Silver nitrate,	gr. iv
Water,	to make f. ℥ ij

M. S. Teaspoonful every hour between meals.

152.

℞
Silver nitrate, gr. x
Potassium permanganate, gr. xv
Distilled water, f. ℥ ij
Mix. Use as wash.

153.

℞
Argentic nitrate, gr. x
Cocaine, gr. xij
Water, enough to make f. ℥ j
Mix and label: Lotion.

154.

℞
Argenti nitratis, gr. v
Ext. gentianæ, q. s.
M. Ft. pil No. 24.
Sig. One pill every 4 hours.

155.

℞
Po. opium, gr. xxv
Silver nitrate, gr. xiiss
Mix and make fifty capsules.
Label: Take as before.

156.

℞
Argenti oxidi, gr. vj
Creosoti, gtt. vj
Glycyrrhizæ, q. s.
M. Make six pills.

157.

℞
Liquoris potass. arsenitis, f. ʒ j
Hydrargyri chloridi cor., gr. j
Aquæ, f. ℥ iv
Misce et fiat sol. Sig. Dessertspoonful three times a day.

158.

℞
Sodii salicylatis, ʒ ij
Quininæ sulph., gr. xxiv
Hydrargyri chlor. cor., gr. ½
Liq. potassii arsenitis, ♏ xlviij
Elixiris aromatici, q. s. ad f. ℥ iij
M.

159.

℞
Fowler's solution, f. ʒ ij
Sol. of dialyzed iron, f. ℥ iv
Mix. Label: Teaspoonful after meals.

160.

℞
Strychninæ hydrochlor., gr. j
Tinct. cinchonæ, f. ℥ j
Liq. ferri dialysati, f. ℥ ss
Liq. potassii arsenitis, f. ʒ ij
Syrupi, f. ℥ iij
Aquæ, q. s. ad f. ℥ vj
M. S. Capiat cochleare parvum post prandium.

161.

℞
Hall's sol. of strych., f. ʒ ij
Fowler's sol. of arsenic, f. ʒ ij
Alcohol, f. ℥ iiss
Mix. Label: Teaspoonful in half glass of water after meals.

162.

℞
Strychninæ nitratis, gr. ij
Liq. potassii arsenitis, f. ʒ ij
Aquæ, q. s. ad f. ℥ iij
M. S. Dram doses.

163.

℞
Fowler's solution, f. ʒ ij
Infusion of cinchona, f. ℥ vss
Tinct. of nux vomica, f. ʒ ij
Mix.

164.

℞
Strych. sulph., gr. j
Arsenous acid, gr. j
Bichloride of mercury, gr. j
Tinct. chlor. of iron, f. ℥ j
Mix. Label: Ten drops after meals.

165.

℞

Ferri reducti,	3.00 Gm.
Acidi arsenosi,	0.35 Gm.
Quininæ sulph.,	8.00 Gm.
Strychninæ sulph.,	0.35 Gm.
Extracti gentianæ,	8.00 Gm.

M. Ft. pil. No. XL.

166.

℞

Massæ ferri carbon.,	
Potassii carbonatis,	aa. ʒ ss
Acidi arsenosi,	gr. ss

M. Ft. pil. No. XX.
Sig. One after each meal.

167.

℞

Atropine sulphate,	gr. ij
Olive oil,	f. ʒ ij

Mix. Label: Apply with friction.

168.

℞

Atropine sulphate,	gr. iss
Strychnine sulphate,	gr. iij
Salicylic acid,	gr. v
Borax,	gr. v
Water,	to make f. ℥ ij

Mix. Label: Teaspoonful twice a day.

169.

℞

Morphinæ sulph.,	gr. iv
Atropinæ sulph., 32 (1–500 gr.) tablets	
Aquæ,	℥ iv

M. S. Teaspoonful every three quarters of an hour.

170.

℞

Solution of arsenic, Br. P.,	♏ cxl
Gold and sodium chloride,	gr. iss
Water,	enough to make ℥ j

Mix. Label: Teaspoonful after meals.

171.

℞

Gold chloride,	gr. x
Menthol, cryst.,	ʒ j
Comp. tinct. of iodine,	f. ʒ v
Glycerin,	f. ʒ vj
Water,	q. s. ad f. ℥ ij

Mix and label: To be used with an atomizer.

172.

℞

Auri et sodii chloridi,	gr. xij
Strychninæ sulph.,	gr. j
Atropinæ sulphatis,	gr. ¼
Fluidextracti cinchonæ,	f. ʒ iij
Aquæ,	q. s. ad f. ℥ vj

M. Ft. sol.

173.

℞

Sol. strych. hydrochlor.,	f. ʒ iij
Sol. of saccharin,	to make f. ℥ ij

Mix. Label: Twenty drops three times a day.

174.

℞

Exalgin,	gr. iv
Betanaphthol,	gr. xij
Lard,	ʒ iv

Mix.

175.

℞

Pepsini saccharati,	ʒ ij
Bismuthi et ammon. cit.,	ʒ j
Acidi hydrochlorici dil.,	gtt. xl
Aquæ,	f. ℥ ij

Misce et fiat solutio.
Sig. Dose, one teaspoonful.

176.

℞

Bismuthi subnitratis,	ʒ ij
Spiritus ammoniæ arom.,	f. ʒ iij
Tinct. opii,	gtt. xx
Zinci acetatis,	ʒ j
Syrupi,	q. s. ad f. ℥ iij

M. S. Teaspoonful every three hours until relieved.

177.

℞

Bismuthi subnit.,	ʒ j
Sodii bicarbonatis,	gr. xxx

M. Fiant pil. No. xx.

178.

℞

Syrupi acidi hydriodici,	f. ℥ ij
Bismuthi subnit.,	ʒ iss

M. S. Teaspoonful three times a day.

179.

℞

Bismuth subnit.,	ʒ j
Potass. iodide,	gr. xv
Tragacanth,	
Quinine sulph.,	aa. gr. xx
Water,	to make f. ℥ iv

Mix. Label: Teaspoonful after meals.

180.

℞

Calcis chloratæ,	
Glycerini,	aa. 10 Gm.

M. S. Apply as directed.

181.

℞

Powdered camphor,	gr. lxx
Lead acetate,	gr. l
Tinct. of iodine,	♏ l
Carbolic acid,	gr. xx

Mix and make 24 pills.

182.

℞

Chloral hydrate,	gr. xl
Camphor,	gr. x
Syrup of ginger,	f. ℥ ij
Water,	f. ℥ iij

Mix and mark: Teaspoonful three times a day.

183.

℞

Camphoræ,	
Chloralis,	aa. 5 Gm.
Cocainæ hydrochloridi,	5 Dg.

M. S. To be applied externally as directed.

184.

℞

Acetanilid,	
Salol,	aa. ʒ j
Monobromated camphor,	ʒ ss

Mix and make 40 pills.

185.

℞

Tinct. guaiaci ammon.,	f. ʒ ij
Mucilaginis acaciæ,	f. ʒ ij
Quininæ sulph.,	gr. viij
Ac. sulphurici dil.,	f. ʒ iv
Potassii bicarb.,	ʒ iss
Aquæ,	q. s. ad f. ℥ iv

M.

186.

℞

Thymol,	
Salicylic acid,	aa. gr. xxx
Menthol,	gr. xx
Eucalyptol,	ʒ iss
Benzoic acid,	ʒ j
Sodium bicarbonate,	
Borax,	aa. ʒ ij
Oil of wintergreen,	ʒ ss
Glycerin,	
Water,	aa. q. s. ad f. ℥ xvj

Mix. Label: Gargle.

187.

℞

Iron and ammonium citrate,	grs. lxxx
Pot. bicarb.,	ʒ iss
Magnesium sulph.,	℥ ss
Glycerin,	f. ℥ ss
Water,	to make f. ℥ viii

Mix. Label: Dessertspoonful three times a day.

188.

℞

Rhubarb,	
Sodium bicarbonate,	aa. gr. xxx

Mix and make 12 pills.

189.

℞
Ammonii carbonatis, gr. xx
Ammonii chloridi, gr. xxx
Syrupi allii, f. ℥ j
Aquæ, q. s. ad f. ℥ ij
M. S. One half teaspoonful as required.

190.

℞
Ammonii carbonatis, ʒ j
Syrupi ipecacuanhæ, f. ʒ j
Vini pepsini,
Misturæ amygdalæ, aa. f. ℥ j
M. S. Teaspoonful in milk every three hours.

191.

℞
Potassii bromidi, ʒ iij
Chloralis, ʒ iv
Elixiris aromatici, q. s. ad f. ℥ ij
M. S. Take one teaspoonful at night.

192.

℞
Chloral hydrate,
Quinine sulphate, aa. ʒ j
Potassium bromide, gr. xl
Water, to make f. ℥ ij
M. S. Teaspoonful at night.

193.

℞
Potassii cyanidi, ʒ ss
Chlorali hydrati, ʒ ij
Cerati, ℥ j
Misce et signa: Unguentum.

194.

℞
Chloral hydrate, ʒ j
Phenacetin, gr. xl
Quinine sulphate, gr. l
Mix and put into 10 capsules.
Label: Take one at night.

195.

℞
Ext. henbane, gr. xvj
Ext. cannabis ind., gr. xvj
Chloral hydrate, ℥ ivss
Potassium bromide, ℥ ivss
Alcohol, f. ℥ j
Water, to make f. ℥ xvi
Mix. Label: Teaspoonful at night.

196.

℞
Potassii chloratis, ʒ ij
Acidi hydrochlorici, f. ʒ ij
Aquæ, f. ℥ viij
M. S. Gargle.

197.

℞
Calomel, gr. vj
Potassium chlorate, ℈ j
Sugar, powd., ʒ j
Mix and make six powders.
Label: One every two hours.

198.

℞
Liquor. ferri chloridi, f. ℥ ij
Potassii chloratis, gr. xxx
Glycerini, f. ℥ j
M. S. Teaspoonful twice a day.

199.

℞
Tinct. ferri chlor., ʒ ss
Potassii chloratis, ʒ iv
Morphinæ sulph., gr. ij
Aquæ, ℥ iv
M.

200.

℞
Potassii chloratis, ʒ j
Tincturæ ferri chloridi, f. ʒ j
Acidi carbolici, gtt. x
Aquæ, q. s. ad f. ℥ vj
M. S. Use as gargle.

201.

℞
Potassii citratis, ʒ ij
Potassii chloratis, ʒ iiss
Spiritus ætheris nitrosi, f. ℥ j
Aquæ camphoræ, f. ℥ vj
M. S. Dessertspoonful every two or three hours.

202.

℞
Potassii chloratis, gr. xx
Catechu, gr. xxx
M. et fiant pulv. No. VI.

203.

℞
Potassii chloratis, gr. iv
Sulphuris præcip., gr. vj
Antimonii sulphur., gr. j
Sacchari, gr. x
Tere. Fiant chartulæ 2.
Signa: Insufflation.

204.

℞
Sodii bicarbonatis, ʒ ij
Sodii salicylatis, ʒ iv
Chloroformi, ʒ ss
Acidi carbolici, ♏ x
Aquæ fontanæ, q. s. ad ℥ iv
M. S. Teaspoonful one hour after meals.

205.

℞
Oil of cinnamon, gtt. x
Chloroform,
Tincture of opium,
Spirit of camphor,
Aromat. spirit of ammonia, aa. f. ʒ v
Whiskey, ℥ iss
Mix. Dose: One dram as needed.

206.

℞
Thymol, gr. x
Alcohol, f. ℥ ss
Ammonia, f. ʒ ij
Sol. of chlorinated soda, f. ℥ iss
Mix. Label: Use as spray.

207.

℞
Acidi carbolici, ʒ iij
Aquæ ammoniæ,
Liq. sod. chloratæ, aa. ʒ ij
Aquæ, q. s. ad f. ℥ viij
M. S. Lotion.

208.

℞
Chromic acid, gr. iv
Cocaine hydrochloride, gr. vj
Water, ʒ ij
Mix. Use as caustic.

209.

℞
Acidi chromici, 5 Gm.
Glycerini,
Alcoholis, aa. 5 Cc.
M. S. Caustic.

210.

℞
Salicylic acid,
Resorcin, aa. ʒ ss
Chrysarobin, ʒ j
Collodion, to make f. ℥ iij
M. Apply as directed.

211.

℞
Hydrarg. chlor. mit.,
Cocainæ hydrochlor., aa. gr. j
Pepsini, gr. iv
Aquæ, quantitas sufficiens
Divide in pilulas numero octo.

212.

℞
Cocaine hydrochlor., 0.8 Gm.
Flexible collodion, 10.0 Gm.
Mix. Apply with camel-hair brush.

213.

℞
Cocaine hydrochloride, gr. j
Silver nitrate, gr. j
Distilled water, to make f. ℥ j
Mix and label: Put one drop in each eye at night.

214.

℞

Cocain. hydrochlor.,	
Morph. sulphatis,	aa. gr. xv
Chlorali hydrati,	
Camphoræ,	aa. ʒ ij
Tinct. cannabis ind.,	
Chloroformi,	
Ætheris,	aa. f. ℥ ij

M. S. Ten drops in a teaspoonful of water every two hours until relieved.

215.

℞

Camphor,	gr. iiss
Menthol,	gr. iss
Cocaine hydrochlor.,	gr. v
Liquid petrolatum,	f. ℥ iv

Mix and make solution.

Label: Spray nose and throat when needed.

216.

℞

Cocaine,	gr. x
Liquid petrolatum,	f. ℥ ss

Make solution. Label: Apply as directed.

217.

℞

$C_{18}H_{21}NO_3$,	gr. 14
KI,	dr. 2½
$C_3H_8O_3$,	oz. 1½
H_2O,	oz. 2

M. S. Teaspoonful every four hours.

218.

℞

Morphine hydrochlor.,	gr. iss
Codeine,	gr. iij
Ammonium chloride,	gr. xx
Water, enough to make	f. ℥ ij

Mix and label: Teaspoonful every two hours for cough.

219.

℞

Acidi carbolici,	ʒ j
Collodii,	ʒ vij

M. Ft. sol.

Sig. Apply with camel-hair brush.

220.

℞

Tinct. of iodine,	f. ʒ ij
Collodion,	f. ʒ iij
Stronger ammonia water,	f. ʒ j

Mix. Apply with camel-hair brush.

221.

℞

Copaibæ,	
Tinct. ferri chlor.,	
Tinct. cantharid.,	aa. 10 Cc.
Glycerini,	20 Cc.
Syrupi,	50 Cc.

M.

222.

℞

Fluidext. cannab. ind,	f. ʒ j
Copaibæ,	f. ʒ iv
Tinct. guaiaci,	
Ol. terebinthinæ,	aa. f. ʒ ij
Tinct. camphoræ,	f. ʒ iss
Syr. zingiberis,	q. s. ad f. ℥ iv

Misce. Fiat mistura.

223.

℞

Copaibæ,	
Pulv. cubebæ,	aa. ʒ j

Misce et fiant pilulæ No. xx.

Signa: One night and morning.

224.

℞

Oil of cubebs,	f. ʒ iij
Oil of sandalwood,	f. ʒ iv
Copaiba,	f. ℥ j
Sp. of nit. ether, to make	f. ℥ iv

Mix. Label: Teaspoonful three times a day.

225.

℞
Boric acid, ʒ iv
Creolin, f. ʒ j
Water, f. ℥ xv
Mix and label: Lotion for the eye.

226.

℞
Zinci sulphatis,
Cupri sulphatis, aa. ʒ j
Morphinæ sulph., ʒ ss
Aquæ rosæ, q. s. ad ℥ j
M. S. One or two drops in the eyes twice a day.

227.

℞
Fluidextracti digitalis, f. ʒ iv
Potassii acetatis, ʒ iij
Elixiris, f. ℥ ij
Aquæ, q. s. ad f. ℥ vj
Misce et signa: Teaspoonful every four hours.

228.

℞
Ergotin, gr. x
Tinct. of cinnamon, f. ℥ j
Mix and label: Take as directed.

229.

℞
Ergotinæ, gr. xx
Apioli, f. ʒ iss
Olei sabinæ, f. ʒ ss
Mix and make 18 pills.

230.

℞
Cocaine hydrochloride, gr. ij
Salicylic acid, ℈ ij
Phenacetin,
Exalgin, aa. ʒ j
Mix and make 30 powders.

231.

℞
Quininæ sulph., ʒ j
Ferri phosphatis sol., ʒ ij
Strychninæ sulph., gr. j
Acidi phosphorici dil., f. ℥ ss
Syrupi zingiberis, f. ℥ ij
Aquæ, q. s. ad f. ℥ iv
M. S. Teaspoonful three times a day.

232.

℞
Quinine sulphate, ʒ j
Strychnine sulphate, gr. j
Sulphuric acid dil., ʒ ij
Iron pyrophosphate, sol., ʒ j
Syrup ginger, to make f. ℥ vj
Mix. Teaspoonful three times a day.

233.

℞
Fowler's sol., f. ʒ ij
Pot. acetate, ʒ vj
Elix. iron pyrophos., to make f. ℥ viij
Mix. Teaspoonful after meals.

234.

℞
Tinct. ferri chloridi, ʒ ij
Aquæ ammoniæ, q. s. to neutralize the acid
Syrupi, f. ℥ ij
Misce. Signa: Dessertspoonful three times a day.

235.

℞
Potassii acetatis, ʒ viss
Sodii bicarbonatis, ʒ ij
Morphinæ sulphatis, gr. ij
Tinct. ferri chlor., f. ʒ j
Quininæ sulphatis, gr. x
Aquæ dest., q. s. ad f. ℥ vj
M. S. Teaspoonful three times a day.

236.

℞
Sod. phosphate, ℥ ss
Tr. chlor. of iron, f. ℥ iss
Water, to make f. ℥ iv
Mix. Teaspoonful three times a day.

237.

℞
Ferri et quinin. cit., 2 Gm.
Potassii iodidi, 5 Gm.
Syrupi,
Aquæ, aa. 30 Cc.
M.

238.

℞
Ferri et potass. tartratis, ʒ ss
Potassii iodidi, ʒ ss
Quininæ sulphatis, gr. xv
Acidi sulphurici dil., ♏ xx
Syrupi, f. ℥ ss
Aquæ, q. s. ad f. ℥ ij
M. S. Teaspoonful twice a day.

239.

℞
Tincture chloride of iron, f. ℥ j
Dilute phosphoric acid, f. ℥ j
Syrup of hypophosphites, f. ℥ viij
Mix. Label: Teaspoonful after meals.

240.

℞
Calcii hypophosphitis,
Sodii hypophosphitis, aa. ʒ ij
Liq. potassii arsenitis, f. ʒ j
Tinct. ferri chlor., f. ℥ j
Ac. phosphorici dil., f. ʒ j
Strychninæ sulph., gr. j
Aquæ, q. s. ad f. ℥ iv
M. S. Teaspoonful three times a day.

241.

℞
Tinct. ferri chlor., f. ʒ iv
Potassii chloratis, ʒ j
Glycerini, f. ℥ j
Fluidextracti glycyrrhizæ, f. ℥ j
Aquæ, q. s. ad f. ℥ iv
M. S. One teaspoonful four times a day.

242.

℞
Citrated caffeine, 2.0 Gms.
Spirit nitrous ether, 20.0 Cc.
Basham's mixture, 100.0 Cc.
Mix. Label: Dessertspoonful three times a day.

243.

℞
Tinct. chloride of iron, f. ʒ j
Sol. of arsenous acid, f. ʒ ss
Quinine sulphate, gr. x
Cinnamon water, f. ℥ ij
Mix. Label: Teaspoonful three times a day.

244.

℞
Tinct. ferri chloridi, f. ʒ ij
Quininæ sulph., gr. xviij
Spiritus chloroformi, f. ʒ j
Aquæ pimentæ, q. s. ad f. ℥ iv
M.

245.

℞
Sod. salicylate, ʒ ij
Glycerin, f. ℥ ss
Tinct. chlor. iron, f. ℥ iss
Syrup, f. ℥ iss
Sol. ammonium acetate, q. s. ad f. ℥ iv
Mix. Label: Teaspoonful four times a day.

246.

℞
Tinct. ferri chlor., f. ʒ ij
Aquæ gaultheriæ, f. ℥ iij
Syrupi tolutani, f. ℥ j
M. S. Teaspoonful one half hour after meals.

247.

℞
Salol, gr. xxx
Tincture chlor. of iron, f. ʒ ij
Syrup, enough to make f. ℥ iij
M. S. Teaspoonful three times a day.

248.

℞
Tinct. ferri chloridi, 3 Cc.
Tinct. guaiaci ammon., 30 Cc.
Tinct. aloes, 15 Cc.
Syrupi, q. s. ad 120 Cc.
M.

249.

℞
Quinine sulph., gr. l
Podophyllin, gr. iv
Tinct. chlor. of iron, f. ʒ iiss
Tinct. of rhubarb, f. ℥ iss
Mix.

250.

℞
Tinct. ferri chloridi, f. ʒ iv
Acidi carbolici, ʒ j
Acidi sulphurosi, f. ʒ iij
Aquæ, q. s. ad f. ℥ viij
Misce et signa: Gargle.

251.

℞
Liq. potassii arsenitis,
Syrupi ferri iodidi, aa. f. ʒ ij
Syrupi tolutani, f. ℥ iss
M. S. Teaspoonful three times a day.

252.

℞
Glycerini, ʒ iij
Sodii boratis, ʒ ss
Unguenti, ʒ iij
M. S. Apply at night.

253.

℞
Acidi carbolici, 3 Gm.
Sodii bicarb., 15 Gm.
Sodii boratis, 15 Gm.
Glycerini, 35 Cc.
Aquæ, q. s. ad 1000 Cc.
Misce. Sig. Use as gargle.

254.

℞
Iodoform, ʒ ij
Balsam of Peru, ʒ iij
Glycerin, f. ʒ xiv
Mix and mark: Apply as directed.

255.

℞
Glyc. boroglycerini, ℥ j
Hydrargyri chlor. cor., gr. ij
Aquæ, q. s. ad ℥ iv
M. S. Apply to ulcer.

256.

℞
Boroglycerin, 50%, ʒ iv
Vaselin, ʒ iv
Mix. Label: Apply freely.

257.

℞
Hydrargyri chlor. cor., gr. v
Glycerini, f. ʒ ss
Liq. calcis saccharati, f. ℥ j
Aquæ, q. s. ad O. j
M. S. Lotion.

258.

℞
Hydrargyri chlor. cor., 0.5 Gm.
Ammonii carbonatis, 2.5 Gm.
Potassii iodidi, 2.5 Gm.
Aquæ, q. s. ad 150 Cc.
M S. Dilute with three times its volume of water and use as directed.

259.

℞
Hydrargyri chlor. cor., gr. ij
Infusi cinchonæ, f. ℥ iv
Sp. ammoniæ aromatici, f. ʒ ij
M. S. Cochleare minimum bis in die.

260.

℞

Hydrargyri chlor. cor.,	gr. iv
Sodii arsenatis,	gr. iiss
Strychninæ sulph.,	gr. $\frac{1}{4}$
Potassii carbonatis,	
Ferri sulph. exsic.,	aa. gr. x

Misce et fiant pilulæ No. x.

261.

℞

Mercuric chloride,	gr. ij
Tinct. chloride of iron,	f. ℥ j
Quinine sulphate,	ʒ j
Dilute hydrobromic acid,	f. ℥ j
Water,	to make f. ℥ vj

Mix. Label: Teaspoonful three times a day.

262.

℞

Hydrargyri chlor. cor.,	gr. ss
Liq. potass. arsenitis,	f. ʒ iss
Quininæ sulphatis,	gr. x
Aq. menth. piper.,	q. s. ad f ℥ j

M. S. Half teaspoonful three times a day.

263.

℞

Corrosive sublimate,	gr. j
Strychnine nitrate,	gr. $\frac{1}{3}$
Fowler's solution,	f. ʒ j
Essence of pepsin,	f. ℥ ij
Comp. syrup hypophosphites,	to make f. ℥ iv

Mix. Label: Teaspoonful in a little water after meals.

264.

℞

Liquoris acidi arsenosi,	f. ʒ j
Hydrargyri chlor. cor.,	gr. j
Strychninæ sulphatis,	gr. j
Spiritus vini rectificati,	f. ʒ j
Aquæ,	f. ℥ j

Misce. Signa: Teaspoonful night and morning.

265.

℞

Liq. ammonii acet.,	
Syrupi ferri iodidi,	aa. f. ℥ ss
Syrupi tolutani,	f. ℥ ij
Hydrarg. chlor. corrosivi,	gr. ss
Creosoti,	f. ʒ ss

M.

266.

℞

Calomel,	gr. ij
Pepsin,	gı. xx
Sodium bromide,	gr. xl

Mix and make four powders. Label: Take one every hour.

267.

℞

Acidi hydrobromici,	♏ x
Phenacetini,	gr. xl
Quininæ sulph.,	gr. xx
Hydrargyri chlor. mit.,	gr. v
Codeinæ sulph.,	gr. ij
Ext. nucis vomicæ,	gr. ij

Misce et divide in partes æquales decem ingerendas in capsulas gelatinosas.

Sig. Horum capsularum una sumatur omni trihorio.

268.

℞

Hydrarg. chlor. mitis,	gr. xx
Syr. zingiberis,	f. ℥ j
Ac. hydrochlorici,	f. ʒ j
Elixiris,	f. ℥ j

M. S. Dessertspoonful before going to bed.

269.

℞

Hydrargyri chlor. mitis,	℈ j
Ammonii chloridi,	ʒ j

Misce et divide in partes æquales viginti.

Sig. Sumat unam bis vel ter in die.

270.

℞
Ammonii carbonatis, ʒ j
Hydrarg. chlor. mitis, gr. xij
M. Ft. capsulæ No. VIII.
Sig. One every three hours.

271.

℞
Calomel, gr. x
Sodium bicarb., gr. xx
Sugar, powd., gr. xl
Mix and make 40 powders.

272.

℞
Hydrargyri chlor. mit., gr. viij
Acaciæ, ʒ ij
Aquæ lauro-cerasi, f. ℥ ij
M. S. Shake well. Teaspoonful at 8 and 10 o'clock P.M.

273.

℞
Calomel, gr. xv
Lime water, f. ℥ iv
Mix and apply as directed.

274.

℞
Antipyrine, gr. xx
Calomel, gr. x
Sodium bicarb., ʒ j
Mix and make 20 powders.

275.

℞
Mercury protiodide, gr. xvj
Potassium iodide, ℥ iij
Water, f. ℥ iij
Mix and make solution.
Label: One half teaspoonful three times daily.

276.

℞
Hydrarg. oxidi flavi, gr. ij
Cocainæ hydrochlor., gr. ij
Acidi borici, gr. iv
Petrolati, ʒ iv
Mix. Apply to the eyelid at night.

277.

℞
Ichthyol,
Zinc sulphate, āā. ʒ ss
Glycerin, f. ʒ ij
Water, to make f. ℥ ij
Mix. Label: Apply as directed.

278.

℞
Ichthyol, ʒ j
Tr. iodine, f. ʒ j
Resorcin, ʒ j
Petrolatum, ℥ ij
M. Apply night and morning.

279.

℞
Ichthyol, ʒ j
Phenol, gr. xxiv
Ammon. chlor., gr. xl
Hydrous wool fat, ʒ iv
Mix and make ointment.

280.

℞
Ichthyol, gr. xx
Quinine sulph., gr. xij
Resorcin, gr. xx
Tinct. nux vomica, f. ʒ ij
Water, to make f. ℥ ij
Mix. Label: Teaspoonful as needed.

281.

℞
Ichthyol, ʒ ij
Ft. caps. No. 12.

282.

℞
Strychnine, gr. j
Caffeine, gr. iij
Arsenous acid, gr. j
Iodoform, gr. viij
Syrup of hydriodic acid, f. ℥ ij
Syrup of hypophosphites, f. ℥ vj
Mix. Label: Teaspoonful four times a day.

283.

℞
Menthol, gr. viii
Iodoform, ʒ j
Ether, f. ℥ j
Liquid petrolatum, to make f. ℥ iv
Mix. Make solution. Label: Spray.

284.

℞
Iodoform, gr. xxx
Boric acid, ʒ j
Calomel, gr. xx
Bismuth subnitrate, ʒ j
Mix. Label: Dust on abraded surface as directed.

285.

℞
Iodoform,
Tannic acid, aa. ʒ ij
Mix and label: Dust over abraded surface.

286.

℞
Iodol, 0.5 Gm.
Yellow oxide of mercury, 0.2 Gm.
Petrolatum, 10.0 Gm.
Mix and make an ointment.

287.

℞
Terpin hydrate, ʒ ij
Iodol, gr. v
Ammon. carbon., gr. xl
Glycerin, f. ℥ iss
Syrup tolu, enough to make f. ℥ iv
Mix. Label: Tablespoonful every two hours.

288.

℞
Hydrargyri, gr. $\frac{1}{3}$
Iodi, gr. $\frac{1}{2}$
Acidi tannici, gr. $\frac{8}{5}$
Glycerini, ♏ xv
M. S. One half by hypodermic injection.

289.

℞
Iodine, resublimed, ʒ ij
Mercurial oint.,
Camphor, aa. ʒ iij
Alcohol, f. ℥ ij
Water, q. s. ad f. ℥ iv
Mix and label: Apply as ointment to the neck.

290.

℞
Hydrargyri chlor. mitis, gr. xxx
Tinct. iodi, f. ʒ ij
Aquæ, q. s. ad f. ℥ iij
M. S. To be painted on swelling on neck.

291.

℞
Ammoniated mercury, ʒ ss
Tincture of iodine, f. ʒ ss
Lard, ℥ j
Mix and make an ointment.

292.

℞
Oleate of mercury, 2%, ℥ j
Iodine, gr. ij
M. Label: Use locally.

293.

℞
Tincturæ iodi, f. ʒ iij
Liquoris potass. arsenitis, f. ʒ ij
M. S. Take five minims in water after meals.

294.

℞
Iodine, gr. xxx
Compound camphor lin., f. ʒ iij
Soap liniment, enough to make f. ℥ ij
Mix. Label: Apply as directed.

295.

℞
Iodine, gr. xxx
Spirit of camphor, f. ℥ j
Soap liniment, f. ℥ ij
Mix and label: Apply as directed.

296.

℞
Pot. iodide, f. ʒ ij
Tr. arnica, f. ℥ ss
Tr. iodine, f. ℥ ss
Chloroform, f. ʒ ij
Cod liver oil, f. ℥ ss
M. Label: Apply locally.

297.

℞
Infusi humuli, f. ℥ vj
Tincturæ iodi, f. ʒ j
Glycerini, f. ℥ j
Mix. Use as directed.

298.

℞
Iodi resublim., gr. xl
Adipis, ʒ j
M. S. Rub over the affected part.

299.

℞
Tincturæ iodi, f. ʒ ij
Glycerini, f. ʒ j
Aquæ, q. s. ad ℥ ij
M. S. Apply locally.

300.

℞
Tincturæ iodi,
Olei terebinthinæ, aa. f. ℥ ss
M. S. Shake and apply locally to spine night and morning.

301.

℞
Cocaine hydrochloride, gr. xx
Tinct. iodine, f. ʒ iij
Phenol, ʒ j
Rose water, f. ℥ j
Glycerin, ad f. ℥ iv
Mix and make solution. Label: Spray for throat.

302.

℞
Sp. ammoniæ arom., f. ʒ ij
Liquoris calcis, f. ℥ iiss
M. S. Dessertspoonful as needed.

303.

℞
Liquoris zinci chloridi, f. ʒ j
Hydrargyri chlor. cor., gr. iv
Liquoris calcis, f. ℥ ij
Aquæ, q. s. ad f. ℥ iv
Misce. Signa: Apply as directed.

304.

℞
Ung. hydrarg. nitratis,
Linimenti calcis, aa. ℥ j
Fiat unguentum, more dicto utendum.

305.

℞
Olei morrhuæ, f. ℥ j
Syr. ferri iodidi, f. ʒ j
Olei gaultheriæ, ♏ v
Syrupi, f. ʒ xv
Liquoris calcis, f. ℥ j
M. S. Dessertspoonful twice a day.

306.

℞
Zinc phenolsulphonate, gr. xxiv
Lead water, f. ℥ ij
Mix and make solution.

307.

℞
Sol. lead subacetate, f. ʒ ij
Soap liniment, to make f. ℥ ij
Mix. Label: Apply with friction.

308.

℞
Solution lead subacetate, f. ℥ viij
Liquid phenol, f. ʒ j
Mix. Label: Apply as directed.

309.

℞

Tannin,	ʒ j
Mercuric chlor.,	gr. ¼
Morph. sulph.,	gr. v
Tr. arnica,	f. ℥ j
Sol. lead subacet.,	
Glycerin,	aa. f. ℥ j
Water,	℥ iv

Mix. Label: Apply locally.

310.

℞

Goulard's extract,	f. ℥ ij
Glycerin,	
Phenol,	aa. f. ʒ ij
Olive oil,	f. ℥ ix

M. Apply as directed.

311.

℞

Zinci oxidi,	ʒ ij
Glycerini,	f. ʒ ij
Liq. plumbi subacetatis,	f. ʒ j
Liquoris calcis,	q. s. ad f. ℥ iv

M. S. Lotion.

312.

℞

Liq. plumbi subacet. dil.,	
Tincturæ opii,	aa. f. ℥ ss
Aquæ,	f. ℥ j

M. S. Lotion.

313.

℞

Sodii phosphatis,	℥ ij
Sodii chloridi,	ʒ iv
Lithii bromidi,	ʒ iij
Aquæ,	q. s. f. ℥ viij

M. Ft. Sol.

Sig. Take dessertspoonful three times a day.

314.

℞

Magnesiæ calc.,	℥ ss
Sodii bicarb.,	ʒ iij
Sp. ammoniæ arom.,	f. ʒ iv
Tinct. zingiberis,	f. ʒ iij
Syr. tolutani,	f. ℥ j
Aq. menth. piper.,	q. s. ad f. ℥ iv

M. S. Dessertspoonful after meals.

315.

℞

Magnesii sulphatis,	℥ j
Tinct. aconiti,	f. ʒ ij
Spiritus ætheris nit.,	f. ℥ ij
Aquæ,	q. s. ad f. ℥ iv

M. ft. sol. Sig. Tablespoonful every four hours.

316.

℞

Fluidextracti valerianæ,	f. ℥ iss
Fluidextracti taraxaci,	f. ℥ ss
Tinct. gentianæ co.,	f. ℥ iv
Magnesii sulphatis,	℥ ij
Aquæ,	q. s. ad O. ss

M. S. Tablespoonful twice a day.

317.

℞

Menthol,	ʒ ss
Boric acid,	ʒ j
Tinct. of hydrastis,	f. ʒ ij
Water,	enough to make f. ʒ iv

Mix. Mark: Use as spray.

318.

℞

Guaiacol carbonate,	gr. iij
Thymol,	gr. j
Menthol,	gr. ss
Eucalyptol,	♏ v

For one capsule. Send 20 such.

319.

℞

Menthol,	
Resorcin,	aa. 1 Gm.
Sp. nitrous ether,	25 Cc.
Alcohol,	50 Cc.
Peppermint water,	50 Cc.

Mix. Label: For mopping the skin.

320.

℞

Morph. acetatis,	.05 Gm.
Potassii iodidi,	2.0 Gm.
Ferri sulphatis,	1.0 Gm.
Aquæ,	50.0 Cc.

M. S. Cochleare parvum omnibus noctibus.

321.

℞

Liq. ammonii acetatis,	f. ℥ ij
Aq. camphoræ,	f. ʒ iss
Spiritus ætheris nit.,	f. ℥ ss
Antimonii et pot. tart.,	gr. ss
Morphinæ acetatis,	gr. ss

M.

322.

℞

Morph. sulph. ! ! !,	gr. vij
Ext. hyoscyami,	gr. v
Ext. cannabis indicæ,	gr. v

Misce. Dispensa in capsulas decem.
Signa: Cursu noctis una sumatur.

323.

℞

Potassium chlorate,	℥ ss
Fluid hydrastis colorless,	f. ℥ ss
Carbolic acid,	gtt. v
Tincture of myrrh,	f. ℥ ss
Peppermint water,	q. s. ad f. ℥ iij

Mix and label: Gargle.

324.

℞

Tinct. myrrh,	f. ʒ iv
Tinct. chloride of iron,	f. ʒ j
Glycerin,	f. ʒ iij
Sat. sol. potass. chlorate,	f. ℥ ij

Mix. Label: Use as gargle.

325.

℞

Olei ricini,	
Glycerini,	aa. 20 Cc.

M. S. Tablespoonful at night.

326.

℞

Liq. iodi comp.,	f. ʒ ij
Liq. potassæ,	f. ʒ iv
Olei olivæ,	f. ℥ j

M. S. Apply as directed.

327.

℞

Alcohol,	30 Cc.
Iodine,	10 Gm.
Turpentine,	200 Cc.

Mix. To be used as a spray.

328.

℞

Spts. turpentine,	f. ℥ iss
Mercuric chloride,	ʒ ss

Mix and make solution.

Iodine,	ʒ ss
Alcohol,	f. ℥ iiss

Dissolve iodine in alcohol and add to above solution.
Label: Liniment.

329.

℞

Vini ipecacuanhæ,	f. ʒ iij
Syrupi scillæ,	f. ʒ vj
Olei terebinthinæ,	f. ʒ iss
Tinct. opii camphoratæ,	f. ʒ v
Liquoris ammonii acet.,	f. ℥ iss
Syrupi,	q. s. ad f. ℥ iv

M. S. Teaspoonful three times a day.

330.

℞

Sodii bromidi,	ʒ ij
Chlorali hydrat.,	ʒ iss
Ol. theobrom.,	q. s.

M. Ft. sup. No. 8.
Sig. One on retiring.

331.

℞
Sodii bicarbonatis, ʒ ij
Pepsini, gr. xxiv
Sodii bromidi, ʒ j
Rhei pulv., gr. xxxij
M. Ft. chart. No. xII.

332.

℞
Iodoformi, gr. xx
Acidi carbolici, gr. xxx
Zinci oxidi,
Balsami Peruvi.,
Petrolati mol., aa. ℥ j
M. S. Apply as directed.

333.

℞
Zinci oxidi, ʒ ij
Zinci carbonatis, ʒ j
Petrolati, ℥ ss
Liquoris calcis, q. s. ad f. ℥ iv
Misce. Signa: Apply with friction.

334.

℞
Carbolic acid,
Vaselin,
Bay rum, aa. ℥ j
Mix and use externally.

335.

℞
Menthol, gr. xx
Chloroform, f. ʒ j
Tinct. benzoin, f. ʒ iss
Liquid petrolatum, f. ℥ j
Mix and Label: Spray the throat every four hours.

336.

℞
Sol. sodium hydroxide, f. ʒ j
Oil of petrolatum, f. ℥ j
M. S. Apply locally.

337.

℞
Piperazine,
Phenocoll hydrochlor., aa. ℈ j
Syrup simple,
Elixir aromatic, aa. f. ʒ j
Peppermint water, f. ℥ j
Water, enough to make f. ℥ ij
Misce et fiat sol.

338.

℞
Acidi carbolici, ʒ iss
Aquæ, q. s. ad ℥ j
M. S. Use with camel-hair brush.

339.

℞
Acidi carbolici cryst., gr. x
Plumbi acetatis, gr. x
Thymolis, gr. xv
Morphinæ sulph., gr. ij
Olei theobromatis, ʒ iij
Misce accuratissime. Fiant suppositoria numero decem.

340.

℞
Carbolic acid, cryst.,
Euphorin,
Aristol,
Tannic acid,
Dried alum, aa. gr. xl
Cacao butter, a sufficient amount
Make suppositories No. xL.

341.

℞
Solution cocaine hydroc., 4%
Phenol,
Glycerin, aa. f. ʒ j
Mix. Label: For toothache.

342.

℞
Salol, gr. x
Oil sandalwood,
Oil cubebs,
Oil wintergreen, aa. M. x
Mix. Put into 12 capsules.
Label: Take one three times a day.

343.

℞
Exalgin, gr. x
Phenacetin, gr. xv
Camphor, gr. v
Salol, gr. xv
Mix and make 10 powders.

344.

℞
Salol,
Thymol, aa. ʒ j
Ext. of nux vomica, gr. x
Ext. of glycyrrhiza, gr. xv
Po. soap, a sufficient quantity.
Mix and divide into 20 pills.

345.

℞
Salol, ʒ ij
Aspirin, ʒ j
Heroin hydrochloride, gr. j
Antipyrine, ʒ j
Strychnine sulphate, gr. $\frac{1}{4}$
Mix and make capsules No. 24.
Label: One every four hours.

346.

℞
Phosphorus, gr. $\frac{1}{3}$
Strychnine sulphate, gr. $\frac{2}{5}$
Soluble phosphate iron, ℈ iv
Detan. elixir cinchona, f. ℥ ij
Mix. Label: Teaspoonful three times a day.

347.

℞
Pilocarpinæ hydrochlor., gr. $\frac{1}{8}$
Hydrarg. chlor. mitis, gr. $\frac{1}{4}$
Misce. Da tales numero octo.
Signa: Horum pulverum sumatur unus nocte maneque.

348.

℞
Pilocarpine, gr. j
Terpin hydrate, ʒ j
Glycerin, f. ʒ ij
Syrup of tolu, f. ℥ iss
Water, f. ℥ iss
Mix and make a solution. Teaspoonful five times a day.

349.

℞
Piperazinæ, ʒ j
Teratur bene. Fiant pulveres duodecim.

350.

℞
Piperazine, ʒ j
Strychnine sulphate, gr. ij
Syrup orange, f. ʒ vj
Chloroform water, to make f. ℥ vj
Mix. Teaspoonful three times a day.

351.

℞
Quininæ sulphatis, gr. xx
Plumbi acetatis, gr. xl
Bismuthi subnitratis, ʒ ss
Syrupi aurantii cort., q. s. ad f. ℥ iv
M. S. Teaspoonful every four hours.

352.

℞
Alum,
Zinc sulphate, aa. ʒ ij
Lead acetate, ʒ iss
Tannic acid, ʒ ss
Mix. Label: One to two teaspoonfuls in a pint of water. Use locally.

353.

℞
Plumbi acetatis, ʒ ss
Acidi acetici dil., ʒ ij
Syrupi tolutani, ʒ iv
Syrupi limonis, ℥ iss
Aquæ cinnamomi, q. s. ad ℥ vj
Mix. Label: Teaspoonful three times a day.

354.

℞

Bismuthi subnit.,	gr. xx
Plumbi subacetatis,	gr. xxx
Morphinæ sulph.,	gr. j
Sodii bicarbon.,	ʒ j

Misce et divide in chartulas decem.
Signa: One powder two hours after each meal.

355.

℞

Acidi salicylici,	gr. x
Potassii permangan.,	gr. xv
Ferri sulphatis,	ʒ iv
Aquæ,	q. s. ad f. ℥ viij

M. S. Lotion for ulcer.

356.

℞

Potassium permanganate,	gr. xx
Oxalic acid,	gr. v
Iron and quinine citrate,	gr. xl

Mix and make pills No. xx. Give one three times a day after meals.

357.

℞

Potassii permanganatis,	2 Gm.
Glycerini,	4 Gm.
Aquæ,	q. s. ad 50 Cc.

M. S. Apply externally.

358.

℞

Acidi carbolici,	ʒ j
Potassii permanganatis,	gr. xx
Aquæ,	f. ℥ v

M. S. Lotion.

359.

℞

Potassii permanganatis,	gr. xx
Ext. glycyrrhizæ,	gr. xx
Glyceriti amyli,	q. s.

M. Fiant pil. No. xxv.

360.

℞

Quininæ sulph.,	
Potassii permangan.,	
Ferri reducti,	aa. gr. x

Misce. Fiant pilulæ No. x.
Sig. Pil. j ter in die.

361.

℞

Quininæ sulphatis,	℈ ij
Olei carophylli,	gtt. ij
Potassii permanganatis,	gr. iij
Acidi sulphur. aromat.,	f. ʒ ij
Mucilag. acaciæ,	q. s. ad f. ℥ viij

M. S. Tablespoonful every three hours.

362.

℞

Zinc sulphate,	gr. xv
Morphine sulph.,	gr. v
Protargol, 2% solution,	f. ℥ iv

Mix. Label: Injection.

363.

℞

Protargol,	gr. x
Cocaine hydrochlor.,	gr. vj
Water,	to make f. ʒ ij

Mix. Label: For the eye.

364.

℞

Acetanilid,	gr. v
Phenacetin,	gr. x
Pyrocatechin,	gr. x

Mix and put into 10 capsules.
Label: One every four hours.

365.

℞

Plumbi acetatis,	gr. x
Acidi pyrogallici,	gr. v
Aquæ,	℥ ij

M. S. Lotion.

366.

℞
Pyrogallic acid, gr. v
Mercuric chloride, gr. ss
Lard, ℥ j
Mix and make an ointment.

367.

℞
Fowler's solution, ʒ j
Quinine bisulphate, ʒ iss
Syr. hydriodic acid, ʒ ij
Water, to make ℥ iij
Mix. Teaspoonful after meals.

368.

℞
Quininæ sulphatis, gr. xx
Acidi sulphurici aromat., f. ʒ ss
Ammonii carbonatis, ʒ j
Syrupi aurantii, q. s. ad f. ℥ iv
M. S. Cochleare parvum t. i. d.

369.

℞
Tinct. ferri chloridi, 10.0 Cc.
Acidi phosphorici dil., 10.0 Cc.
Quininæ sulph., 5.0 Gm.
Stychninæ sulph., 0.1 Gm.
Aquæ dest., 100.0 Cc.
Syrupi limonis, 80.0 Cc.
M. S. Teaspoonful three times a day.

370.

℞
Quinine bisulphate, ℥ ss
Basham's mixture, f. ℥ iv
Mix. Label: Teaspoonful every other hour.

371.

℞
Quininæ sulphatis, ʒ iss
Strychninæ sulphatis, gr. ss
Tinct. ferri chloridi, ℥ iss
M. S. Half a teaspoonful in a glass of water three times a day.

372.

℞
Quininæ sulph., gr. xvj
Acidi tannici, ℈ j
Acidi sulphurici arom., ♏ v
Syr. eriodictyi arom., q. s. ad f. ℥ ij
M. S. Teaspoonful twice a day.

373.

℞
Quininæ sulph., 2.0 Gm.
Tinct. cantharidis, 3.5 Cc.
Spiritus rosemarini, 15.0 Cc.
Infusi salviæ, 120.0 Cc.
M. S. Apply to the scalp.

374.

℞
Quininæ sulph., gr. xl
Sodii salicylatis, gr. l
Trional, ʒ ss
M. Ft. pil No. 10.
S. Take one three times a day.

375.

℞
Citrate of iron and quin., ʒ iiss
Carbolic acid,
Tinct. of lavender co., aa. ʒ ss
Wine, enough to make ℥ iv
Mix. Label: Teaspoonful three times a day.

376.

℞
Potassium iodide, ʒ j
Tinct. belladonna, ♏ xl
Fluidext. grindelia, ℥ j
Syrup tolu, ℥ iss
Water, to make ℥ iv
M. S. Two teaspoonfuls in water after meals.

377.

℞
Quinine bisulph., ʒ j
Resorcin, ʒ ss
Glycerin, f. ℥ ss
Alcohol, f. ℥ ij
Water, to make f. ℥ viij
M. Label: Apply with friction.

378.

℞
Menthol, gr. vj
Eucalyptol, ♏ vj
Resorcin, gr. iv
Liquid petrolatum, ℥ j
Make solution. Label: Use as spray.

379.

℞
Hydrarg. chlor. mit., gr. x
Santonini, gr. xij
M. et fiant capsulæ No. 2.
S. To be taken three hours apart.

380.

℞
Fluidextract of pinkroot,
Fluidextract of senna, aa. f. ℥ j
Turpentine, f. ʒ j
Santonin, gr. xv
Fluidext. of dandelion, f. ʒ vij
Syrup, f. ℥ j
Mix. Label: Teaspoonful morning, noon, and night.
Shake well before using.

381.

℞
Calomel, ʒ ij
Soap, ʒ ij
Cotton-seed oil, f. ℥ j
Water, f. ℥ j
Mix. Label: Apply with friction.

382.

℞
Quinine bisulphate, ʒ ij
Po. boric acid, ℥ ij
Po. castile soap, ℥ ij
Mix and make impalpable powder.
Label: As directed.

383.

℞
Tinct. ferri chloridi, ʒ iss
Sodii thiosulphatis, ʒ iss
Potassii chloratis, ʒ iij
Quininæ sulphatis, gr. xv
Aquæ, f. ℥ ij
M. S. Teaspoonful three times a day.

384.

℞
Calomel, gr. iv
Sod. thiosulphate, gr. xl
Mix. Make 8 capsules.
Label: One every two hours.

385.

℞
Potassium citrate, ʒ iv
Strontium bromide, ʒ vj
Aromatic elixir, to make f. ℥ iij
Mix. Label: Teaspoonful as directed.

386.

℞
Liq. strychninæ, B. P., 1.5 Cc.
Sodii bicarbonatis, 3.0 Gm.
Aquæ, q. s. ad 100.0 Cc.
Misce et signa: Teaspoonful three times a day.

387.

℞
Solution of strychnine, Br. P., f. ʒ iss
Potassium iodide, gr. xc
Water, enough to make f. ℥ ij
Mix. Label: Teaspoonful after meals.

388.

℞
Pot. iodide, ʒ iij
Strychnine sulph., gr. j
Fowler's solution, f. ʒ iss
Water, to make f. ℥ iv
Mix. Teaspoonful four times a day.

389.

℞
Gold and sodium chlor., gr. ss
Strychnine sulphate, gr. j
Alcohol, f. ℥ j
Syrup cinnamon, f. ℥ ij
Water, to make f. ℥ vj
M. Take one teaspoonful in water after each meal.

390.

℞
Strychninæ, gr. j
Glycerini, ♏ xxx
Aquæ, q. s. ad f. ʒ iij
M. S. Inject ten minims.

391.

℞
Calomel, gr. j
Salol, gr. xx
Trional, gr. x
Make capsules No. 6.
Label: One every hour.

392.

℞
Calcis calcinatæ, ʒ ij
Sulphuris, ʒ iij
Aquæ, f. ℥ iv
Mix and boil for ten minutes and then filter.
Label: Use as directed.

393.

℞
Morphine sulphate, gr. vj
Terpin hydrate, ʒ iiss
Sodium bromide, ʒ iv
Strychnine sulph., gr. ss
Elixir, to make ℥ iij
M. S. Teaspoonful every six hours.

394.

℞
Diuretin, gr. x
Sp. of nitrous ether, ♏ xxx
Tinct. chlor. of iron, ʒ iv
Syrup, enough to make f. ℥ ij
Mix. Label: Teaspoonful three times a day.

395.

℞
Thymol, gr. xv
Borax, gr. xxx
Water, ℥ ij
Make solution. Label: Mouth wash.

396.

℞
Salol, gr. xlv
Thymol, gr. xxx
Bismuth subnit., gr. lxxv
Mix. Make 15 konseals.

397.

℞
Sodii boratis, gr. x
Zinci sulphatis, gr. ij
Aquæ camphoræ, f. ʒ j
Aquæ rosæ, q. s. ad f. ℥ j
M. S. Put one drop in each eye night and morning.

398.

℞
Zinci chloridi,
Zinci iodidi, aa. gr. ij
Aquæ, q. s. ad f. ℥ j
M. S. Injection.

399.

℞
Zinci sulphatis,
Pot. sulphuratæ, aa. gr. xxx
Aquæ rosæ, ℥ vj
Mix. Label: Lotion.

400.

℞
Zinc sulphate, gr. vj
Menthol, gr. xv
Liquid petrolatum, f. ℥ j
Mix. Label: Use with atomizer.

401.

℞
Aspirin, gr. xl
Acetanilid, gr. xxiv
Citrated caffeine, gr. iv
Aromat. spirit ammonia, q. s. ad f. ℥ j
Mix. Label: One teaspoonful every two hours.

402.

℞
Sodium citrate, ʒ iiss
Spirit nitrous ether, f. ℥ iss
Water, to make f. ℥ ij
Mix. Label: Teaspoonful three times a day.

403.

℞
Calcii hypophosphitis, ʒ x
Potass. hypophosphitis, ʒ viij
Sodii hypophosphitis, ʒ x
Ferri lactatis, gr. iij
Strychninæ lactatis, gr. iss
Acidi lactici, f. ʒ vj
Elix. gentianæ et tinct. ferri chloridi, f. ℥ viij
Aquæ, q. s. ad f. ℥ xvj
M. Ft. solut.
S. Teaspoonful three times a day.

404.

℞
Tr. chlor. of iron, f. ℥ j
Dil. phosphoric ac.,
Glycerin, aa. f. ℥ ij
Co. sol. sod. phos., f. ℥ iij
Mix. Teaspoonful in ½ glass of water after each meal.

405.

℞
Alcohol, f. ℥ ij
Salicylic acid, ℥ ss
Oil gaultheria, f. ʒ ij
Oil cajuput, f. ℥ j
Petrolatum, ℥ vj
Make ointment. Rub on pain.

406.

℞
Sodii salicylatis, ʒ iij
Quininæ sulphatis, gr. xvj
Tinct. podophylli, f. ʒ ij
Spir. ætheris nitrosi, f. ʒ iv
Aquæ camphoræ, f. ℥ vj
M. S. Dessertspoonful twice a day.

407.

℞
Potas. iodide, ʒ j
Sodium salicylate, ʒ iv
Syrup orange, to make f. ℥ iv
Mix. Label: teaspoonful after meals.

408.

℞
Quininæ sulphatis, ℈ j
Acidi sulphurici aromat., ♏ xxx
Spir. ammoniæ aromat., f. ℥ ss
Syr. sarsaparillæ co., f. ℥ ivss
M. S. Dessertspoonful three times a day.

409.

℞
Acidi carbolici, ʒ j
Tr. iodi, ʒ ij
Acidi tannici, ʒ j
Cerati, ℥ iv
Misce. Signa: Ointment.

410.

℞
Sol. adrenalin hydrochlor., f. ʒ ij
Menthol, gr. x
Liquid petrolatum, f. ℥ j
Mix and make a spray. Label: Spray three times a day.

411.

℞
Red iodide mercury, gr. ij
Pilocarpine hydroc., gr. v
Sol. adrenalin chlor., m. x
Petrolatum, ℥ j
M. Label: Apply locally.

412.

℞
Alum, ʒ ij
Borax, ʒ iij
Glycerin, f. ℥ j
Water, to make f. ℥ iv
Mix. Apply as directed.

413.

℞

Mercuric chloride, gr. j
Tartar emetic, gr. j
Morph. hydrochloride, gr. iij
Aromat. spirit of ammon., f. ʒ v
Syrup of liquorice, ℥ iij
Mix. Label: Teaspoonful when coughing.

414.

℞

Antipyrine, 0.3
Pyramidon, 0.3
Salol, 0.1
Codeine, 0.01
Citrated caffeine, 0.08
Mix. Make 12 capsules.
Label: One every hour.

415.

℞

Tr. aconite, f. ʒ iss
Spt. nit. ether., f. ʒ vj
Antipyrine, ʒ j
Syr. tolu, to make f. ℥ iv
Mix and make solution.
Teaspoonful every hour till fever cools.

416.

℞

Hydrarg. chlor. corros., gr. iij
Zinci sulphocarbol., gr. iv
Morphinæ sulph., gr. ij
Liq. hydrogenii dioxidi, f. ℥ j
Aquæ rosæ, q. s. ad f. ℥ vj
M. S. Use as directed three times a day.

417.

℞

Silver nitrate, gr. ij
Glycerin,
Listerine, aa. f. ℥ j
Water, to make f. ℥ iv
Mix. Label: Use as directed.

418.

℞

Mercuric chloride, gr. j
Fowler's solution, gtt. xlviij
Syrup iodide of iron, ʒ vj
Elixir of cinchona, to make ℥ vj
Mix. Label: Teaspoonful after meals.

419.

℞

Liquoris sodii arsenatis, f. ʒ j
Syrupi ferri iodidi, f. ʒ vij
M. S. One half teaspoonful in water three times a day.

420.

℞

Chlor. of gold and sod., gr. xij
Ammonium muriate, gr. vj
Strychnine nitrate, gr. j
Atropine sulphate, gr. ½
Fluidext. of cinchona, f. ℥ iij
Fluidext. of coca, f. ℥ j
Water,
Glycerin, of each f. ℥ j
M. L. One teaspoonful every two hours.

421.

℞

Tr. capsici, f. ʒ j
Acidi carbolici, ♏ xx
Bismuthi subnit., ʒ v
Alcoholis, f. ʒ ij
Olei gaultheriæ, f. ʒ j
Spir. ammon. aromat., f. ʒ iv
Aquæ, f. ℥ ij
Misce. Signa: Take one half teaspoonful as directed.

422.

℞

Antipyrine, ʒ iiss
Caffeine, ʒ ij
Sod. bromide, ʒ vj
Syrup of lemon, f. ℥ iss
Cinnamon water, to make f. ℥ iv
Mix. Label: Teaspoonful as needed.

423.

℞
Sodium salicylate, ʒ iss
Caffeine citrate, gr. xx
Phenazone, ʒ j
Syrup of orange, f. ʒ iij
Water, to make f. ℥ iv
M. L. Teaspoonful three times daily.

424.

℞
Calamine, ʒ j
Zinc oxide, ʒ iss
Glycerin, f. ℥ j
Lime water, to make f. ℥ iv
Mix. Label: Lotion.

425.

℞
Ext. henbane,
Ext. stramonium, aa. gr. vi
Camphor,
Asafœtida, aa. ʒ j
Ext. can. indica, gr. v
Mix and make 30 capsules.
Label: One three times a day.

426.

℞
Chloral hydrate,
Camphor, of each ʒ j
Starch, ℥ j
Mix. Label: Rub on as directed.

427.

℞
Cocaine mur., gr. v
Morph. mur., gr. iiss
Glycerin, f. ʒ iv
Sweet almond oil, f. ʒ iv
Mix.

423.

℞
Salol, ʒ j
Oil sandalwood, f. ʒ ij
Copaiba, f. ʒ iv
Cascara evacuant, f. ʒ iv
Peppermint water, to make f. ℥ iv
Mix. Label: Dessertspoonful every four hours.

429.

℞
Copaiba,
Tinct. cubebs,
Sp. nitrous ether,
Comp. tinct. lavender, aa. f. ℥ j
M. Label: Teaspoonful three times a day.

430.

℞
Syrup hypophosphites, f. ℥ ij
Tinct. chloride iron, f. ʒ ss
Tinct. nux vomica, f. ʒ ss
Peppermint water, to make f. ℥ iv
Mix. Label: Teaspoonful in water after meals.

431.

℞
Fluidextract ergot,
Tr. chlor. iron, aa. f. ʒ vj
Tr. nux vomica, f. ʒ iv
M. L. Take thirty-five drops three times a day.

432.

℞
Liq. ferri dialysati, f. ℥ j
Tinct. lavendulæ co., f. ʒ iv
Tinct. gentianæ co., f. ʒ iv
Bismuthi subnitratis, f. ʒ iij
Elix. lactopeptin, q. s. ad f. ℥ iv
M. S. Shake well and take one teaspoonful after each meal.

433.

℞
Tinct. chlor. iron, f. ʒ ij
Potas. chlorate, ℥ j
Glyc. tannic acid, f. ℥ ss
Water, to make f. ℥ iv
Mix. Label: Gargle.

434.

℞
Heroinæ, gr. iv
Hydrarg. chlor. cor., gr. ¼
Ol. terebin., gtt. lxxx
Tinct. aconiti, gtt. xx
Strych. nit., gr. ¼
Muc. acaciæ, f. ℥ ij
M. S. Teaspoonful in a little water every three hours.

435.

℞
Corros. chlor. mercury, gr. j
Iodide of potass., ʒ ij
Mur. tinct. iron. f. ℥ ss
Syr. sarsaparilla, f. ℥ iss
Ess. of pepsin, to make f. ℥ iv
Mix. Label: Teaspoonful in one half glass of water after eating.

436.

℞
Pot. iodide, ʒ ij
Ammon. carb., ʒ j
Salicylic acid, ʒ iij
Mercuric chlor., gr. ij
Syr. orange, f. ℥ ss
Water, to make f. ℥ iij
Mix. One teaspoonful in water three times daily.

437.

℞
Bichloride of mercury, gr. j
Sodium arsenite, gr. ss
Strychnine sulphate, gr. ss
Carbonate of potass.,
Dried sulphate of iron, aa. gr. ix
Mix and divide into nine pills. Label: One after each meal.

438.

℞
Cocaine, 4.0
Ichthyol, 10.0
Glycerin, 41.0
Water, to make 100.0
Mix. Label: Lotion.

439.

℞
Tannic acid, ʒ ij
Tinct. of iodine, ♏ lxxx
Potassium iodide, gr. xx
Tinct. of myrrh, ♏ lxxx
Rose water, to make f. ℥ viij
Mix. Label: Dessertspoonful in water as mouth wash.

440.

℞
Iodi, gr. xxx
Pot. iodidi, gr. xxv
Petrolat. liq., f. ʒ ij
Ol. terebinth., f. ʒ ij
Mix. Label: Paint on as directed.

441.

℞
Powd. borax, ʒ ij
Tinct. myrrh, f. ʒ ij
Water, to make f. ℥ ij
Mix. Label: As directed.

442.

℞
Strychnine, gr. ss
Cacao butter, a sufficient amount
Make twelve suppositories. Label: Insert one three times a day.

443.

℞
Camphor, gr. xij
Salol, gr. xxx
Oil theobroma, a sufficient amount
Make six suppositories.
Label: Insert one every night.

444.

℞
Salol, ʒ j
Tinct. chlor. iron,
Sp. nitrous ether, aa. f. ʒ iv
Glycerin,
Syrup, aa. f. ℥ j
Water, to make f. ℥ vj
Mix. Label: Tablespoonful three times a day.

445.

℞

Tinct. opium,	f. ℥ j
Tinct. gambir co.,	f. ℥ ij
Lead acetate,	gr. xv
Zinc sulph.,	gr. xv
Rose water,	to make f. ℥ viij

M. Label: Use as directed.

446.

℞

Bis. subnit.,	ʒ iv
Tannic acid,	gr. xxx
Tinct. arnica,	f. ℥ iss
Sol. lead subac. dil.,	f. ℥ ij
Tinct. iodine,	f. ʒ ij
Rose water,	to make f. ℥ vj

Mix. Label: Apply locally.

447.

℞

Potassii chloratis,	ʒ ij
Syr. ferri iodidi,	f. ℥ ij
Vini antimonii,	f. ʒ ss
Spt. chloroformi,	f. ʒ ij
Aquæ,	q. s. ad f. ℥ viij

M. S. Teaspoonful three times a day.

448.

℞

Potas. permangan.,	gr. xv
Ergotin,	gr. x
Codeine sulph.,	gr. iij

Make caps. No. x.
Label: One three times a day.

449.

℞

Quininæ sulph.,	1.3 Gm.
Sodii salicylatis,	15.5 Gm.
Acidi hydrobromici dil.,	30.0 Cc.
Aquæ,	q. s. ad 250.0 Cc.

M. S. Teaspoonful every four hours.

450.

℞

Strontium bromide,	℥ iss
Sodium iodide,	℥ j
Magnesium sulphate,	℥ j
Syrup,	f. ℥ ij
Water,	to make f. ℥ xij

Mix. Label: Dessertspoonful three times a day.

CRITICISMS

1.

Borax is soluble in 15 parts of water, and in this case there is not enough to dissolve it. Boric acid requires 18 parts of water to dissolve it, but it is much more soluble in a solution of borax. The principal difficulty with this prescription is that the mucilage of acacia is gelatinized by the borax, making a stiff mass. Boric acid has not the effect of gelatinizing acacia, and borax is prevented from doing so by the presence of sugar. Glycerin also prevents this action by decomposing the borax.

2.

If the oil is emulsified and then the borax dissolved in the water is added a tough solid mass is formed. If, however, the borax is dissolved in the syrup with a little water and then added to the emulsion no trouble is experienced. Sugar prevents the gelatinizing effect of borax on the acacia.

3.

When solution of lead subacetate is added to mucilage of acacia a solid gelatinous mass is formed. In this prescription if both are diluted with the water and mixed with constant stirring the acacia is precipitated in small masses. By putting the mucilage into a mortar and adding the solution in small portions with constant stirring, and then adding the water, a good mixture can be made. Neutral lead acetate does not gelatinize mucilage of acacia.

4.

The alcohol of the tincture throws the acacia out of solution and the water of the mucilage precipitates the resin from the tincture so that a white precipitate ultimately forms in the bottom of the bottle. A fresh tincture of guaiac with mucilage of acacia may give a blue color but an old tincture gives a brown red color. With the consent of the physician the

prescription was filled by using glycerin and water instead of mucilage. One dram of honey and seven drams of water in place of the mucilage keeps the resinous matter suspended.

5.

Using the amount of acacia called for, it is almost impossible to make a good emulsion on account of the alcohol precipitating the acacia and cracking the emulsion. The best way is to make a primary emulsion of the copaiba by using one and a half drams of acacia and three drams of water. This leaves some water, a part of which should be used in diluting the emulsion and a part in diluting the mixture of tincture and spirit before adding to the emulsion. A smooth emulsion can thus be made.

6.

The alcohol in the spirit and tincture precipitates and ferric chloride gelatinizes the mucilage of acacia. The gelatinous mass will slowly dissolve in the syrup on standing. The best way to fill the prescription is to dilute the tincture with part of the syrup and mix the rest of the syrup with the spirit and then these with the mucilage. In this way the gelatinization is avoided.

7.

Ferric salts gelatinize mucilage of acacia, and if the solution of dialyzed iron is added directly to the mucilage a solid mass results, which dissolves slowly in the syrup. By diluting the solution of iron with the syrup, and then adding this slowly to the mucilage with constant stirring, a thick homogeneous liquid may be obtained.

8.

Different results may be obtained by changing the order of mixing these ingredients. If the corrosive sublimate is dissolved in the water and then added to the lime water the yellow mercuric oxide is precipitated. This if mixed with the mucilage and allowed to stand for some time changes to a dirty brown color. If the lime water is added to the solution of

mercury the red brown basic chloride of mercury is precipitated. If the solution of mercuric chloride is added to the mucilage of acacia and then the lime water added to this no precipitation of mercury takes place. On allowing this to stand for a few days a flocculent precipitate is formed, slowly increasing. Acacia prevents the precipitation of a number of the heavy metals by the alkaline hydroxides.

9.

This mixture is far from being a solution. The benzoin and the tolu are only partially soluble in alcohol and the acacia is insoluble. The insoluble matter quickly settles to the bottom of the mixture, forming a layer nearly equal in depth to that of the supernatant liquid. It, however, may be readily diffused through the liquid by agitation. A "Shake well" label is necessary.

10.

Spirit of nitrous ether with acetanilid gives a yellow solution, becoming red on standing for some time. The color occurs more quickly with an acid spirit than with a neutral one, and the presence of a little sodium bicarbonate prevents it for several weeks. Probably diazo-compounds are formed.

11.

When the acetanilid is added directly to the tincture of iron it makes a deep red clear solution. On adding the water the acetanilid is precipitated and the color changed back to that of diluted tincture of iron. A better mixture can be made by powdering the acetanilid first, mixing with water and acacia or tragacanth, then adding the tincture of iron highly diluted with water. The tincture of iron, unless diluted with water, has a tendency to coagulate acacia.

12.

When antipyrine is rubbed with resorcin a pasty mass results, and this gradually becomes liquid. Acetanilid and resorcin triturated together make a liquid. When an aqueous solution

of antipyrine is mixed with a solution of resorcin a white precipitate is formed. Acetanilid requires 190 parts of water for solution, so that in this prescription it will not be all dissolved. No matter how this is filled a clear solution cannot be made. Rub the acetanilid and antipyrine in the mortar with about 2 Gm. of acacia, and then add a part of the water. Dissolve the resorcin in the balance of the water and add it.

13.

Phenacetin requires 1310 parts of water or 15 parts of alcohol for solution. In filling this prescription the phenacetin can be dissolved in the tincture and spirit, but on adding the syrup and water nearly all of it will be thrown out of solution. A better mixture would be made by powdering the phenacetin with about one dram of acacia, then adding the syrup and part of the water, and lastly the tincture and spirit diluted with the balance of the water.

14.

Phenacetin is only sparingly soluble in water, but more soluble in alcohol, although there is not enough present in this prescription to dissolve it entirely, and what is dissolved is again thrown out of solution on adding the water. Heating the phenacetin with the tincture causes solution to take place, giving a dark red color. On adding water the color is destroyed and the phenacetin is precipitated. The best way to fill this prescription is to powder the phenacetin, mix with a little acacia, and add the water and lastly the tincture of iron. Filled in this way the phenacetin is in a finer powder than when it is first dissolved in the tincture.

15.

Sodium bromide precipitates the codeine salt, ammonium chloride does not. The phenacetin is not dissolved. The mucilage will keep the codeine and phenacetin suspended so that the prescription can be dispensed as a shake mixture.

16.

Ferric acetate is formed in this prescription and it gives a very deep red color to the solution. If the ingredients answer the pharmacopœial requirements there will be no incompatibility. However, the solution of ammonium acetate is sometimes quite strongly alkaline, due to excess of ammonium carbonate or deficiency of acetic acid used; and if the tincture of iron is free from an excess of acid the alkali causes the formation of ferric hydroxide which will be kept in solution by the syrup.

17.

On dissolving the quinine sulphate in part of the cinnamon water with the aid of the sulphuric acid, then adding the potassium acetate previously dissolved in the remainder of the water, a voluminous precipitate of quinine acetate is obtained. Quinine acetate is only sparingly soluble in water, and the amount here formed is so large and bulky that it is difficult to pour out an even dose. By using one half of a dram of dilute sulphuric acid a thinner mixture is obtained. Or, the quinine sulphate can be rubbed with about ten grains of acacia and a little water. Then adding the acetate dissolved in the water containing the acid, a good shake mixture can be obtained.

18.

The potassium acetate was dissolved in water and the spirit added. Effervescence ensued and continued for a few minutes, but ceased after several shakings. Alcohol effervesces a little when mixed with water, but not nearly as much as the above mixture did. One writer says that nitrous acid converts acetates into carbon monoxide and other gases. This explanation is not satisfactory since about as much effervescence results when spirit of nitrous ether is added to a strong solution of Rochelle salt, sodium chloride, or potassium nitrate. It has been suggested that the potassium acetate or other salt throws the ethyl nitrite out of solution in the mixture of alcohol and water and that the volatilization of the ethyl nitrite is the cause of the

effervescence. There is much less effervescence when the solutions have been well chilled before mixing.

19.

Prof. Scoville (Bull. Pharm., v. 28, p. 527, also v. 29, p. 174), commenting on this says that on having kept this mixture for about three years it had liquefied. That, "We have the following series of reactions: First, the water of crystallization in the quinine sulphate hydrolyzes the aspirin and changes it into acetic and salicylic acids. Second, these organic acids act slowly upon the quinine and change it into liquid quinotoxin. Third, it is probable that this quinotoxin forms a eutetic mixture with the salicylic acid which is liquid at ordinary temperatures. Reactions of this sort take place more rapidly at elevated temperatures. . . . The liquid mixture should not be administered because the quinotoxin is a very decided poison."

The formation of quinotoxin is undoubtedly slow as this combination has been frequently dispensed without any apparent ill effect.

20.

The cachets may become colored blue on account of the iodine liberated acting on the starch. The aspirin liberates hydriodic acid which is oxidized by the air, liberating iodine. This change takes place more quickly in a moist atmosphere than in a dry one.

21.

Aspirin is only sparingly soluble in water. It is quite soluble in a solution of potassium citrate, and there is enough in this prescription to make a clear solution.

22.

Benzoic acid is soluble in 275 parts of water and salicylic acid in 460 parts of water. If the directions to make a solution with the aid of heat are followed the acids on cooling will separate out in much larger crystals than at first. A better mixture will be obtained by rubbing the acids well in the mortar

and then mixing with the water and cocaine salt in the cold. The acids do not precipitate the alkaloid.

23.

Three chemical reactions may take place in mixing these ingredients. One is between the sodium benzoate and the sulphuric acid, forming sodium sulphate and benzoic acid. The benzoic acid is only sparingly soluble in water, but there is enough of alcohol in the elixir to keep it in solution. Another reaction is between the sulphuric acid and the quinine sulphate, making the soluble bisulphate. The third reaction is between the sodium benzoate and the quinine salt, forming quinine benzoate, which is not very soluble in water. The prescription was filled by dissolving the quinine sulphate in part of the elixir with the acid and the benzoate in the remainder and then mixing the solutions. Precipitation commenced almost at once and in a short time there was a solid mass of needle-shaped crystals. This could be shaken up so that it could be poured.

24.

Ammonium benzoate is the disturbing agent. Citric acid in the citrated caffeine or in the iron salt liberates benzoic acid and precipitates it. Ferric benzoate is only sparingly soluble in water but the citrate prevents its precipitation. Ammonium benzoate gives a sticky precipitate with the quinine in iron and quinine citrate. Precipitation of benzoic acid can be prevented by neutralizing the iron salt and using a proportional amount of caffeine in place of the citrated caffeine and this should be done. Some acacia is necessary to keep the quinine benzoate suspended.

25.

There is not enough of water to dissolve the borax, it being soluble in 15 parts of water. Mercuric chloride requires about 13.5 parts of water, and the twenty grains would require about one half of an ounce. If the mercuric chloride is dissolved in part of the water, and the borax is mixed with the balance of the water and then with the corrosive sublimate solution, or if

the borax is mixed with the water and then the mercuric chloride added to this, the result will be about the same. In either case there will be formed a dark reddish brown precipitate of an oxychloride of mercury, and also a white precipitate of borax. The mercury is ultimately entirely precipitated. If heat is used in dissolving the borax there are quite large clear crystals formed on standing, probably borax. The directions are: Make a lotion. Use frequently.

26.

If a solution of borax is added to a solution of lead acetate a white precipitate of lead borate is formed. Or if the glycerin is added to the solution of lead acetate and then the borax solution added a precipitate is also formed. But if the glycerin is added to the borax solution first the borax is decomposed, with the ultimate formation of sodium metaborate and boric acid, making an acid solution which does not cause as much precipitation.

27.

When these two substances are rubbed together in a mortar with considerable force a damp powder or a soft mass is formed which soon dries. A chemical reaction takes place forming some sodium sulphate and zinc borate, and liberating water of crystallization which causes the dampness. By powdering the ingredients separately and then mixing no difficulty is experienced. The mixture does not make a clear solution in water, a zinc salt being precipitated.

28.

The citric acid should be dissolved in the boiling water and then the magnesium carbonate added to this. Carbon dioxide is liberated and magnesium citrate goes into solution. There is not enough of acid to completely dissolve all the carbonate. The addition of borax does not cause any precipitation, although the solution is alkaline. If the borax is added to the solution of citric acid and then the magnesium carbonate a large amount of the last ingredient is not dissolved, the acid having been nearly neutralized by the borax.

29.

The U.S. Dispensatory (19th ed., 644) gives a formula for making the colorless hydrastis, which consists of twenty grains of hydrastine hydrochloride or sulphate dissolved in a pint of a mixture of glycerin and water. In this prescription we have the borax decomposed by either the honey or the glycerin, with the liberation of boric acid. The boric acid liberates carbon dioxide from the sodium bicarbonate. Carbon dioxide may also be liberated by the bismuth subnitrate, bismuth subcarbonate being slowly formed. The bicarbonate of sodium may liberate the hydrastine from the acid with which it is combined, but the alkaloid will not be precipitated in the presence of so much honey, glycerin, and water.

30.

Borax is alkaline in reaction and precipitates the hydrastine as the free alkaloid, and also precipitates the alkaloids from the tincture of opium. The boric acid is not sufficient to neutralize the alkalinity of the borax. As the preparation is to be dropped into the eye, it should be filtered, and in so doing nearly all of the hydrastine is removed. The physician's attention should be called to this, and he should be advised to increase the amount of acid or decrease the borax or, what is better, leave out the latter. Boric acid does not give a precipitate with a solution of hydrastine sulphate. Or, the prescription can be filled by adding five to seven drops of glycerin directly to the borax, mixing well, adding part of the water, then the other ingredients. Water precipitates a little resinous matter from the tincture.

31.

The acids were dissolved in the water and then the cocaine hydrochloride was added, getting a white precipitate at once. This is the borosalicylate of cocaine. If either acid is left out or if the amounts of both are reduced to one half the amounts, there will be little or no precipitation.

32.

Borax is alkaline in reaction and precipitates nearly all alkaloids from solutions of their salts. It precipitates the cocaine in this prescription, but the difficulty can be prevented by the use of a little glycerin. The glycerin acts chemically on the borax, breaking it up and forming sodium metaborate and boric acid. If boric acid were used instead of borax no precipitation would occur and many pharmacists would use the acid in place of borax.

33.

Chloral hydrate is decomposed by alkalies, forming chloroform and a formate of the base. Borax is sufficiently alkaline so that chloroform will be slowly generated and can be recognized by the odor, but not enough is formed to do any harm.

34.

The potassium citrate was dissolved in the syrup and the spirit was then added. The two liquids were mixed, producing a turbidity, and on standing separated into two distinct layers. Potassium citrate is hygroscopic, but nearly insoluble, in alcohol. The alcohol of the spirit has a tendency to throw the citrate out of solution, but the salt has such an affinity for water that it carries some water with it, forming a solution not miscible with alcohol.

35.

The quinine sulphate dissolves in the water and citric acid, making a clear solution that does not precipitate on standing. On adding the potassium citrate, crystals begin to separate at once. Adding more citric acid will dissolve the precipitate and the addition of another portion of potassium citrate causes a precipitation again. It is said that quinine acid citrate is formed. Whatever the precipitate is, it is probably thrown out of solution by making a concentrated solution of potassium citrate, although this does not entirely explain the result since acid clears up the mixture again. The directions are: Mix. Label: A dessertspoonful after meals.

36.

The cocaine hydrochloride is best dissolved in a little water before mixing with the base. No difficulty is experienced in filling this prescription, but the use of a metallic spatula should be avoided on account of danger of a coloration with gallic acid.

37.

When solutions of the first two ingredients are mixed together the insoluble mercuric iodide is formed, and this is redissolved in excess of potassium iodide, forming potassium mercuric iodide, or, as it is commonly known, Mayer's reagent. This compound precipitates the alkaloids of cinchona in the elixir. The alcohol in the elixir is a solvent for this precipitate, but upon addition of the syrup the alcohol is too dilute to exercise much of a solvent effect. The syrup of rhubarb is generally turbid, and it will also cause a precipitation of some of the matter from the elixir of cinchona. The danger in such a prescription is that the patient may take most of the precipitate at one time and thereby get an overdose of the mercuric iodide, which is thrown out of solution with the alkaloids. In 4 fluid ounces of the elixir of cinchona alkaloids, N. F., there are 7.3 grains of the alkaloidal sulphates. This is more than enough to precipitate all of the mercury, and the prescription should be dispensed with a "shake well" label.

38.

The mercuric chloride combines with the sodium and ammonium iodides, forming insoluble mercuric iodide, which redissolves in excess of the alkali iodides, forming a double compound that precipitates some of the constituents of the compound syrup of sarsaparilla. Ammonium iodide very frequently contains a little free iodine, which probably combines with some of the organic matter present in the syrup. There is no danger of the potassium chlorate liberating iodine from the iodides so long as the mixture is neutral or alkaline. Corrosive sublimate is slowly reduced to calomel by the compound syrup of sarsaparilla (U. S. D.).

39.

Potassium iodide is hygroscopic in a moist atmosphere and powders containing it usually become damp. There is no reaction between calomel and potassium iodide if the mixture is dry, but mixed in the above proportions in the presence of moisture a dark gray powder is produced. Mixed in more nearly equal proportions a yellowish green powder is formed. Chemical reaction takes place, with the formation of potassium chloride and mercurous iodide, which is yellow. The mercurous iodide is decomposed by the excess of potassium iodide, forming metallic mercury and mercuric iodide and then potassium mercuric iodide; it is the metallic mercury that gives the mixture the gray color. This prescription should not be dispensed, because of the oxidation of the mercurous compound to the much more active mercuric compound, or if it is, the dose should be reduced to correspond with that of the mercuric salt. The directions are: Mix, make a powder, and divide into 10 powders (papers).

40.

Several chemical reactions occur, depending on the order of mixing the ingredients. The possible reactions are as follows: 1. The potassium iodide in the tincture of iodine when mixed with a solution of ferric chloride forms free iodine, potassium chloride, and ferrous chloride. 2. Fowler's solution is alkaline, due to the use of potassium bicarbonate which is changed to the normal potassium carbonate. This carbonate neutralizes part of the free hydrochloric acid when mixed with the tincture of iron, forming potassium chloride and carbon dioxide. 3. Ferric chloride with phosphoric acid forms the colorless ferric phosphate, which is insoluble in water, but soluble in water containing free acid. 4. Tincture chloride of iron dissolves quinine sulphate, the free acid of the tincture combining with the quinine sulphate to form a more soluble compound. 5. The iron combines with tannic acid in the rhubarb, forming the black tannate of iron. 6. The free iodine in the tincture of iodine combines with sulphate of quinine, forming an insoluble compound. 7. The free

falls quickly, is potassium bitartrate, formed by the reaction between the potassium iodide and the tartaric acid. That it is not the quinine that is precipitated can be proved by substituting sodium iodide for potassium iodide, when no precipitation takes place. In concentrated solutions potassium iodide precipitates quinine. Hydriodic acid, formed by the action of tartaric acid on potassium iodide, is easily decomposed by the air, liberating iodine which precipitates the quinine. When this mixture is allowed to stand for two or three weeks without being disturbed two layers in the precipitate are noticed, the bottom one is white and is the potassium bitartrate, while the upper one is red brown and is the iodine compound of quinine sulphate. The addition of a few minims of dilute hypophosphorous acid will retard the liberation of iodine. The directions are: Mix. Label: Let a teasponful be taken two or three times a day.

47.

The quinine sulphate was dissolved in a part of the water with the aid of the acid. The potassium iodide was dissolved in the balance of the water and added to the quinine solution. Iodine is gradually formed by the acid acting on the iodide, and this combines with the quinine, forming a dark brown precipitate.

48.

There is not enough of water to dissolve all of the quinine sulphate, as it requires 725 parts of water. The water will precipitate inert extractive matter from the tincture. While potassium iodide does not always precipitate strychnine sulphate when in solution with it, there is some danger of precipitation. (See the incompatibilities of strychnine.) The usual maximum medicinal dose of strychnine sulphate is $\frac{1}{12}$ of a grain. In this prescription the dose is $\frac{5}{16}$ of a grain and is dangerously large. The prescription should not be dispensed without first having called the prescriber's attention to that fact, as well as to the possibility of the strychnine being precipitated by the potassium iodide.

49.

Spirit of nitrous ether is generally more or less acid and in that condition will liberate iodine from potassium iodide. It can be neutralized by shaking with sodium bicarbonate and the excess of bicarbonate removed by settling and decanting. If the acid spirit is allowed to stand with a solution of ammonium acetate and sodium citrate for an hour or more before the iodide is put in, the solution remains colorless for a time but slowly liberates iodine. The nitrous and nitric acids probably replace acetic and citric acids and so no iodine is liberated at once.

50.

Donovan's solution precipitates many alkaloids from aqueous solutions of their salts. Quinine is no exception. This prescription was filled by dissolving the quinine sulphate in most of the syrup with the aid of the acid; dissolving the potassium iodide in the remaining syrup and adding to the first solution. Donovan's solution was then slowly added with constant stirring and the prescription sent out with a "Shake well" label. The danger in such a prescription does not come from the quinine which is precipitated, but the mercuric salt which is precipitated with the quinine. In concentrated solutions of quinine potassium iodide gives a precipitate. At the end of two days all of the mercury was precipitated and some iodine was liberated, the sulphuric acid displacing the hydriodic acid and the air oxidizing the hydriodic acid. Any quinine not precipitated by the Donovan's solution was precipitated by the iodine.

51.

If the ingredients are powdered separately and are perfectly dry when mixed no chemical reaction takes place. The powder will keep for months if protected from moisture. On the addition of water the powder at once becomes dark gray in color. The darkening is due to the formation of metallic mercury; at the same time some mercuric salt is formed, which with the excess of potassium bromide forms a compound soluble in water. This is a dangerous prescription and should not be dispensed unless the

dose is reduced. If the reaction takes place according to the equation given below, each powder will contain about three and eight tenths grains of mercuric salt.

$$Hg_2Cl_2 + 2KBr = Hg + HgBr_2 + 2KCl.$$

52.

This prescription is frequently given as an example of the incompatibility of bromides with strychnine salts. It is said that crystals of strychnine bromide will form after the mixture has been standing for a half hour. The writer failed repeatedly to get a precipitate even on making the solution twice as strong as that called for and also varying the proportions. The precipitation is partially explained by some writers by saying that the strychnine bromide is soluble in water, but insoluble in a solution of potassium bromide. In many instances the commercial potassium bromide is alkaline, due to the presence of a carbonate which has been left in to aid the preservation of the bromide. The carbonate precipitates the strychnine as the free alkaloid.

53.

If the alcohol is evaporated from the tincture and the residue mixed with the other ingredients and put into capsules, the capsules soften and are dissolved on account of the sodium bromide absorbing moisture. This can be prevented by using some absorbent powder.

54.

The silver nitrate is entirely precipitated by the sodium chloride as silver chloride. It is customary to filter eye-washes, and if this one is filtered there will be only a very weak solution of sodium chloride and sodium nitrate left. There is no admissible method by which the precipitation can be prevented without changing the prescription.

55.

It is impossible for the dispenser to tell what the prescriber wanted. "Hyd." may stand for hydrochloric, hydrobromic, hydriodic, or hydrocyanic. From the directions to the patient

to take after meals probably hydrochloric was what was intended, but it would be necessary to consult the physician.

56.

Commercial dilute hydrocyanic acid usually contains some free sulphuric or hydrochloric acid, which has been added to preserve the hydrocyanic acid. If one of these mineral acids is present an effervescence will take place. Hydrocyanic acid itself does not decompose carbonates to any extent. Hydrocyanic acid easily decomposes in water, but in an alkaline solution its decomposition is much quicker, giving a formate and a dark colored precipitate containing paracyanogen.

57.

In lightly mixing the first two ingredients when powdered and perfectly dry no change in color is noticed; triturated together with considerable pressure, the powder turns gray. As soon as moisture comes in contact with the mixed powders they become dark gray — the coloration is due to the formation of metallic mercury — while at the same time a part of the calomel is changed to mercuric chloride and mercuric cyanide. A translation of the latter part of the prescription is: Tragacanth, water, of each a quantity sufficient to make a mass which is to be formed into 30 pills. Label: Take two pills every night.

58.

The dose of potassium cyanide is dangerously large, the usual maximum dose being about one fourth of a grain. The physician, knowing that morphine acetate frequently is not entirely soluble, has directed the use of acetic acid. The excess of acid combines with the potassium, liberating hydrocyanic acid. The potassium cyanide frequently contains a carbonate as an impurity, and in such case might neutralize the free acid and precipitate some of the free morphine. In neutral solutions the potassium cyanide precipitates morphine cyanide from morphine salts. Morphine cyanide is soluble in acid solutions. The prescription should not be filled without consulting the prescriber.

59.

This prescription was filled by dissolving the salts in separate portions of water and then mixing. After a few hours a crystalline precipitate began to appear. The strychnine was liberated from the sulphate by the cyanide solution, which was alkaline. Potassium cyanide is generally more or less alkaline, depending upon its exposure to air. The carbon dioxide of the air decomposes it, liberating hydrocyanic acid. After neutralizing the potassium cyanide with sulphuric acid no precipitation resulted.

60.

This was filled in several ways, the result being the same. The codeine was triturated with a little water and a half dram of dilute phosphoric acid added to dissolve the alkaloid. The hydrocyanic acid was next added, and then the tincture of iodine, which did not precipitate the alkaloid, but was itself decolorized at once. The further addition of the water simply diluted the solution.

If the tincture of iodine is added to the solution of codeine in water and phosphoric acid a reddish brown precipitate is formed, consisting of codeine and iodine. This precipitate is not dissolved by adding an excess of phosphoric acid or sulphuric acid, but the twenty minims of dilute hydrocyanic acid dissolves the precipitate and makes a clear colorless solution. The explanation is that the hydrocyanic acid reduces the iodine to an iodide and thus breaks up the compound of codeine and iodine. Other reducing agents, as sodium thiosulphate, have a similar effect.

61.

By dissolving the morphine in a little water and adding it to the tincture of iron a blue solution may be formed which quickly turns green. When the calcium hypophosphite, dissolved in the water and syrup, is added a white precipitate of ferric hypophosphite is thrown down. The color of the solution is nearly but not entirely destroyed. By adding the morphine dissolved in water to the mixture of other ingredients no colora-

tion is produced, and this is the method that should be followed, as the morphine is not decomposed by the iron hypophosphite. The precipitate of ferric hypophosphite can be dissolved by adding some potassium citrate to the moist magma. A better method of filling is to use the tincture citrochloride of iron of the National Formulary instead of the official tincture of iron, the two tinctures having the same iron strength. By using it no precipitation takes place for several days at least.

62.

Ferrous sulphate usually contains some ferric sulphate and this reacts with the calcium hypophosphite to form ferric hypophosphite and calcium sulphate, the former being only sparingly soluble, and the latter requiring about 380 parts of water for solution. Part of the sulphuric acid of the Epsom salt will go to form calcium sulphate. In an acid solution the potassium chlorate would have an oxidizing effect on the ferrous sulphate and also on the hypophosphite; in this prescription it probably has but little chemical action. The solution of strychnine is a British preparation containing about one per cent of strychnine hydrochloride. Potassium chlorate and a hypophosphite should not be triturated together dry, as they form an explosive mixture.

63.

The calcium hypophosphite slowly reduces the mercuric chloride to mercurous chloride and finally to metallic mercury. This precipitation is not readily seen in the syrup of sarsaparilla, but if water is used instead of the syrup a turbidity is noticed as soon as solutions of the salts are brought together. The syrup of sarsaparilla also has a tendency to reduce the corrosive sublimate, but only very slowly.

64.

Filled as written the white bismuth subnitrate is soon changed to a black precipitate. Using more hydrochloric acid, the darkening takes place sooner and leaving out the acid no darkening results for several days. The hydrochloric acid

... hypophosphites and the ... to the metal.

...

... deliquescent in damp air ... chemical reaction may then ... to become yellow and ... acid solution reduces the ... while the hypophosphite is ... or alkaline solution the ... the extract of nux vomica ... by adding some althæa and ... mixture can be dispensed ... translated into English are: ... 25 equal parts.

...

... this prescription in attempt... together dry and caused ... severely injured. The ... between the chlorate and ... made by powdering the ... lightly with powdered extract ...

...

... heating oleic acid with one ... to make the theoretical ... first dissolved in a little ... than castile soap. On ... prescription, a thick liquid was ... salicylic acid acting on the ... liquid, and making sodium ... no trouble is experienced, ... in the mixture, there can be ... place. Rubbing castile soap ... a mass.

68.

No immediate change is noticed but after a few minutes a gas begins to form and later there is considerable effervescence and red fumes are given off. If phosphoric acid is left out, there is little or no effervescence. The phosphoric acid liberates hydrochloric acid which then reacts with nitric acid making nitrohydrochloric acid and this reacts with alcohol. It has been suggested that the iron may have some catalytic action. This is a dangerous prescription and should not be sent out until reaction has ceased.

69.

Strong nitric acid decomposes creosote, with the formation of red fumes. Dilute nitric acid converts it into a brown resin (U. S. D.). In filling this prescription the nitric acid should be slowly added to the creosote with constant stirring. A considerable heat is generated by the reaction, and the mixture should be allowed to cool before adding the chloroform, so that it will not be volatilized. It is doubtful if this prescription has much caustic effect.

70.

The oil of turpentine reacts with the acids, with the generation of much heat, and unless care be taken it will be ignited. The acids should be mixed and cooled and then added in small portions to the oil, cooling after each addition. The alcohol should be added last, after the mixture is cold, so as to avoid volatilization.

71.

The nitrohydrochloric acid oxidizes the hypophosphites to phosphates, but there is nothing in the appearance to indicate chemical reaction.

72.

Spirit of turpentine is another name for oil of turpentine. Oil of turpentine is easily oxidized and nitrohydrochloric acid is a strong oxidizing agent, so that there is quite a violent reaction when the two are brought together. Even though

the oil is emulsified first, chemical change cannot be avoided. Supposing that the prescriber wanted a four-ounce mixture, the dose of the acid would be about thirteen minims. The maximum dose, as given in the U. S. Dispensatory, is six drops. The excessive dose would be sufficient to prohibit the filling of this prescription. In such a case where the prescriber could not be notified many pharmacists would use the dilute nitro-hydrochloric acid instead of the concentrated.

73.

This makes a clear colorless solution at first. In a day or two it acquires a yellow color which deepens. The products formed have not been determined. A similar prescription containing glycerin is sometimes written, and it does not change in color so readily.

74.

If the acid is added to the tincture a red coloration is formed at contact of the two liquids. This red color quickly changes to an orange and then to a yellow when the liquids are mixed. The changes in color are probably due to the action of the acid on the brucine. If now the mixture is allowed to stand a short time a further chemical reaction is evidenced by the evolution of bubbles of gas. This reaction continues slowly for several hours, and is due to the acid acting on the organic matter other than the alkaloids, probably tannin. The dilution with the elixir does not prevent it. On adding the acid or the elixir to the tincture a precipitate of inert matter is produced.

75.

The fluidextracts and elixir are sufficiently acid so that chemical reaction takes place between the potassium nitrite and the organic matter. Considerable effervescence ensues and continues for some time. Oxides of nitrogen are given off. A slight precipitate forms on standing. Probably much of the physiological activity of the mixture is destroyed by the chemical reaction.

76.

This gave a clear solution at first but a turbidity was noticed within an hour and by the next morning the bottom of the bottle was covered with a white precipitate which responded to the tests for calomel. Mercuric chloride is slowly reduced to calomel by alcohol (M. & M., I. 98). This does not explain the ready reduction that occurs, and the writer is inclined to think that the nitrous ether or acid has some effect.

77.

The spirit of nitrous ether is generally acid in reaction, and when an acid solution of nitrous ether is brought in contact with potassium iodide, iodine is liberated and the gas nitric oxide is formed. This prescription should not be filled on account of the free iodine formed.

78.

This mixture is quite frequently prescribed by physicians, even by those who know that it is incompatible. A chemical, reaction takes place between the nitrous ether and the tannin in the buchu, causing an evolution of oxides of nitrogen. There is less reaction if the spirit has first been neutralized. Spirit of nitrous ether reacts with an aqueous solution of potassium acetate, giving off a gas, the composition of which has not been definitely determined. The gas must be allowed to escape before corking the bottle. Some of the resinous matter in the fluidextract will be precipitated by the water.

79.

Several chemical reactions are possible in filling this prescription, depending upon the order of mixing the ingredients. If the potassium bicarbonate is added to the syrup of lemon, carbon dioxide will be liberated by the citric acid. Spirit of nitrous ether is usually acid with nitrous and nitric acids, and these will liberate the carbon dioxide if brought in contact with the bicarbonate. The solution of potassium hydroxide is capable of neutralizing the acid in the spirit or part of that in the syrup. The spirit of nitrous ether if added directly to

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.olution, colorless at
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s given off.

˙ clear solution resulted,
. but within five minutes
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. ˙. the color changes are
..d that ethyl nitrite or
nitrous acid forms with
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: ˙: was thought that this
: is not now generally

. ˙. added to the resorcin
. ˙ .s red solution is formed.

This is perhaps due to the formation of dinitroso-resorcin (or possibly mononitroso-resorcin), which crystallizes in yellowish plates. Using a spirit that has been neutralized with sodium bicarbonate seems to make no difference. Ammonia turns this solution a deep blue.

83.

The spirit of nitrous ether gives a blue color with a fresh tincture of guaiac but a brown one with a tincture that has been exposed to the light for a time. The nitrous acid would probably affect the alkaloid colchicine, since it is so easily decomposed. Acids usually give yellow solutions with colchicine, but this change would not be noticed here. The syrup precipitates resinous matter from the tinctures.

84.

The tannin in the tincture of digitalis makes a black inky mixture with the tincture of iron. The phosphoric acid added to the tincture of iron before the two tinctures are mixed partially prevents, or if added after partially destroys, the inky color, the final mixture being dark brown and turbid. If two drams of dilute phosphoric acid be added to the tincture chloride of iron the mixture becomes entirely colorless, due to the formation of ferric phosphate, and on the subsequent addition of a tannin solution the black color is not produced. A little light colored precipitate is formed.

85.

On adding the phosphoric acid to a solution of the iron and quinine citrate a white precipitate forms which gives tests for iron but not for quinine. It is probably iron phosphate and is soluble in a considerable excess of the acid. When the dilute phosphoric acid is further diluted with water and then added to the iron salt dissolved in the balance of the water with the syrup, little or no precipitation takes place. When the tincture is added to this, a turbidity results and the mixture acquires a dark green color, due to the precipitation of matter from the tincture and the formation of tannate of iron.

86.

[illegible] sulphate was dissolved in the tincture of iron [illegible] the elixir added. The strychnine sulphate [illegible] of the elixir and added to the iron [illegible] acid added last. Adding the acid [illegible] a nearly white precipitate which is phos-[illegible] water is used in place of the elixir no precipita-[illegible] phosphate of iron is insoluble in water but [illegible] water, and it is thrown out of solution by [illegible] elixir.

87.

[illegible] requires 2.7 parts of water to dissolve [illegible] the syrup it does not all dissolve. It [illegible] adding to the syrup and water and [illegible] dispensed with a "Shake well" abel. [illegible] crystalline salt with water makes a [illegible] in the bottle.

88.

[illegible] phosphate of the U. S. P. is the Na_2HPO_4 and [illegible] litmus. This alkalinity may cause pre-[illegible] strychnine and it should be neutralized with a [illegible] before the solutions of sodium phosphate [illegible] are mixed.

89.

[illegible] natural to expect that these two solids would [illegible] powder but the mixture becomes damp after [illegible] dries out. There is some rearrangement of bases [illegible] which the water of crystallization is liberated.

90.

[illegible] carbonate is dissolved in water and the tincture is [illegible] a precipitate having the color of iron rust, probably [illegible] hydroxide and oxide of iron is formed. The amount [illegible] with the amount of free acid in the tincture. On [illegible] salicylate and stirring a brown red clear solution is

formed. If the salicylate is first dissolved in water and the iron added a dark red solution is formed having some purplish color in it. On adding the bicarbonate to this the purplish color is destroyed. If tincture of citro-chloride of iron is used instead of the U. S. P. tincture, no precipitate is produced by the bicarbonate and the color of the finished solution is much lighter at first but gets darker. The solution is alkaline.

91.

Salicylic acid, being only sparingly soluble, is brought into solution with the aid of sodium phosphate, which is alkaline. The salicylate gives a deep red color with the iron, due to ferric salicylate.

92.

If concentrated solutions of the first two ingredients are mixed a reddish brown salicylate of iron is precipitated. The citric acid in the syrup of lemon precipitates salicylic acid from a concentrated solution of lithium salicylate. By dissolving the iron salt in a part of the water and adding the syrup, then dissolving the salicylate in the balance of the water and mixing the solutions, a clear deep red solution can be obtained. The deep red color is due to the ferric salicylate formed.

93.

The salicylic acid is not readily soluble in the water and glycerin; it requires 460 parts of water for solution. If the acid is dissolved in the glycerin with the aid of heat and the tincture then added a clear solution results, but on adding the water a bulky crystalline precipitate comes down. A better method of filling is to rub the acid with the glycerin and water and then add the tincture. Free iodine reacts with salicylic acid, giving mono-, di-, and tri-iodobenzoic acids and tri-iodophenol (M. & M., III. 680). All of the iodine is not changed.

94.

This makes at first a clear colorless solution, but within a day or two becomes of a dark brownish red color. On standing a few days there is a slight precipitation, the amount depending

on the condition of the salt and the spirit. If the salt is neutral and the spirit strongly acid a small amount of salicylic acid will be thrown out of solution. By neutralizing the acid the precipitation is prevented and the coloration hindered, although care must be used not to make the solution alkaline, as an alkaline solution of a salicylate quite quickly becomes colored. Possibly there is some nitrosalicylic acid formed in this prescription. The directions are: Mix. Label: Dessertspoonful three times a day.

95.

A mixture of these ingredients sometimes becomes soft and sticky in a short time and again it may remain in a powder for days. The condition of the atmosphere seems to cause the variation. "The reaction between sodium salicylate and antipyrine, thought to be due to chemical change, is simply due to deliquescence." (Nat. Dispensatory, 5th ed., 227.) This explanation is hardly satisfactory, since either chemical alone is not hygroscopic. By putting these ingredients into capsules separately without previous mixing they in time become soft and liquid, but not before the prescription would ordinarily be used. The capsules might be dispensed in a bottle.

96.

There is not a sufficient amount of water to dissolve all of the quinine sulphate. If the sodium salicylate is dissolved in part of the syrup and the quinine is mixed with the balance of the syrup and these two brought together a bulky gelatinous precipitate of quinine salicylate is formed. The resulting mixture is so thick that it can be poured only with difficulty. When a little sulphuric acid is used to aid the solution of the quinine sulphate, or when quinine bisulphate is used, the precipitate of quinine salicylate subsequently formed is generally more bulky and tenacious.

97.

On standing, the citric acid in the syrup combines with the sodium, liberating salicylic acid, which, being only sparingly soluble in water, is precipitated in needle-shaped crystals. This

can be dispensed as a shake mixture. The precipitation is rather tardy, and it would be well to inform the patient of the change which will take place.

98.

On mixing the acid with the bicarbonate in the presence of water effervescence takes place, due to the liberation of carbon dioxide; a nearly colorless quite strongly alkaline solution results. If this is allowed to stand undisturbed for two or three days the lower part of the liquid will be of a light brown color and the upper part of a dark brown, and finally it will become dark brown throughout. An aqueous solution of a salicylate turns dark when exposed to the air probably on account of the formation of some oxidation products. This change takes place much more quickly when the solution is alkaline. If the physician has prescribed sodium salicylate instead of the salicylic acid and sodium bicarbonate he would have gotten practically the same physiological effect unless he wanted the effect of the alkali too, made a better preparation pharmaceutically, and saved the pharmacist considerable time and work. The patient should be informed of the change of color that will take place.

99.

Salicylic acid is soluble in [illegible] parts of water [illegible] of glycerin; consequently [illegible] something else [illegible] two and a half times [illegible] solution of salicylic acid [illegible] prescription [illegible] solution. [illegible] ammonium citrate [illegible] physician [illegible]

100.

[illegible]

duced. The acid will liberate the carbon dioxide from the mass of carbonate of iron, causing the pills to swell and forming ferrous sulphate. The acid should be omitted.

101.

The Rochelle salt throws some of the camphor out of solution. Then on the addition of the aromatic sulphuric acid the turbidity is increased on account of the separation of the oil of cinnamon and the resin of ginger. Chemical reaction takes place between the Rochelle salt and the sulphuric acid, the sodium sulphate going into solution and potassium bitartrate being precipitated.

102.

The potassium nitrate and the lead acetate were powdered separately and then mixed with the oil. To this the sulphuric acid was added slowly with constant stirring, avoiding letting the mixture get hot. The carbolic acid was added last. The mixture thus produced was black and thick. Several reactions ensue, depending to some extent upon the order of mixing. 1. Sulphuric acid with lead acetate gives lead sulphate and acetic acid. 2. Sulphuric acid with potassium nitrate forms potassium sulphate and nitric acid. 3. The nitric acid may act on the oil, oxidizing it. 4. The nitric acid may act upon the carbolic acid, forming picric acid. 5. The sulphuric acid forms with carbolic acid sulpho-carbolic acid. 6. Sulphuric acid has a carbonizing effect upon the oil.

103.

There is considerable danger in mixing these ingredients and the directions to "mix cautiously" should be followed. The potassium bichromate was powdered and mixed with the tar. To this the sulphuric acid was added with constant stirring. Heat and acrid fumes were generated. The mixture was a black, soft, granular mass, which after standing a day was scarcely acid to litmus paper. It probably had but little caustic effect.

104.

Although the sulphuric acid aids the solution of the quinine sulphate, it precipitates the glycyrrhizin of the fluidextract. The

glycyrrhizin, thus precipitated as glycyrrhizic acid, loses much of its sweet taste and no longer disguises the taste of the quinine. It would have been better if the prescriber had omitted the sulphuric acid and directed a shake mixture. The water causes the separation of a small amount of inert matter from the fluid-extract.

105.

On adding the sulphurous acid to the tincture of iron the mixture becomes of a much darker red color at first and then nearly colorless. The glycerin may now be added and then the potassium chlorate dissolved in the water. There is barely a sufficient amount of water to dissolve the chlorate at the ordinary temperature, and after mixing with the other ingredients some of the salt is thrown out of solution by the alcohol of the tincture. Different chemical reactions take place, depending on the order of mixing. The possible reactions are as follows: 1. Between the ferric iron and the sulphurous acid, forming ferrous sulphate and hydrochloric acid. 2. Between the potassium chlorate and the hydrochloric acid in the tincture, forming chlorine. 3. Between the chlorine and the ferrous sulphate, forming a ferric salt and a chloride. 4. Between the chlorine and the sulphurous acid, forming sulphuric and hydrochloric acids. 5. Between the chlorine and the glycerin. 6. Between the potassium chlorate and the sulphurous acid, forming potassium sulphate and hydrochloric acid.

106.

If the potassium chlorate and the glycerin are rubbed together an explosion is liable to occur. The chlorate and acid react to form a chloride and sulphate. After a day or two no odor of sulphurous acid can be detected. The chlorate does not all dissolve in the water, but the excess should not be filtered out, as it is to be mixed with more water before being used.

107.

When the sulphurous acid is added to the solution of the sodium hypophosphite in the cinnamon water a turbidity results,

due to the separation of free sulphur. The hypophosphite is oxidized to a phosphate and the sulphurous acid is reduced to sulphur. In the presence of a very large excess of the hypophosphite the sulphur is further reduced to hydrogen sulphide.

108.

This gives a clear solution at first, but often on standing a heavy mass of crystals will form in a few hours. Sodium sulphite dissolves in about 2 parts of water but is nearly insoluble in alcohol. An excess of the salt is liable to be used as it is frequently effloresced. The alcohol in the spirit probably throws it out of solution and the ethyl nitrite may change it to the sulphate which is a little less soluble.

109.

This mixture gives a precipitate on standing, light and bulky if the water used is cold, or small and dense if the water is hot. Any two of the ingredients can be dissolved in water without getting an appreciable precipitate. The precipitate seems to be tannic acid which is salted out of solution by the chlorate and acid.

110.

In solution lead subacetate with zinc sulphate gives a precipitate of lead sulphate; a precipitate of lead tannate with the compound tincture of catechu; a precipitate of the opium alkaloids with the laudanum. Zinc sulphate is partly precipitated as the tannate by the compound tincture of catechu. The tannic acid in the compound tincture of catechu precipitates the opium alkaloids. Water precipitates resinous matter from the tinctures. The exact reactions will vary with the method of filling. This prescription should be dispensed without filtering but with a "shake well" label.

111.

On mixing these ingredients a blue black solution is obtained. This is due to the presence of some ferric sulphate. Ferrous sulphate as found in drug-stores nearly always con-

tains some ferric sulphate. If strictly ferrous sulphate is used tannic acid gives no coloration with it.

This prescription was filled by dissolving the clear crystals of ferrous sulphate in water, adding four grains of sodium thiosulphate and two drops of sulphuric acid, and boiling until all of the ferric iron was reduced to the ferrous, as shown by adding a drop of this solution to a solution of potassium sulphocyanide and getting no red color. The tannic acid was dissolved in another portion of water, the syrup added, and this added to the iron solution. A colorless liquid was obtained, astringent but not inky in taste. In three days the solution had assumed a green color and in ten days it was blue black. This change, caused by the oxidation of the iron by the air, would have taken place sooner if the bottle had been opened frequently.

112.

Tannic acid precipitates the zinc salt only slightly but does give a precipitate of morphine tannate and of lead tannate. Lead subacetate with zinc sulphate gives a precipitate of lead sulphate and with morphine muriate a precipitate of morphine alkaloid. Some lead chloride is formed. As this prescription is to be used locally, it can be filled without danger.

113.

The iodine is reduced by the tannic acid, but not completely, and a turbid mixture is made. According to the U. S. D., hydriodic acid is formed and combines with a portion of the tannic acid and remains in solution, while the oxygen of the decomposed water combines with another portion of the tannic acid to form an insoluble compound. This mixture is capable of dissolving iodine.

114.

The sodium salicylate and benzoate and the carbolic acid were dissolved in the lime water, making a nearly clear colorless solution, and then the tannic acid was added. A blue white precipitate was formed, due to the reaction between the

tannic acid and lime water. The precipitate afterwards slowly turned to a dirty yellow color.

115.

The tannic acid in the tincture combines with the quinine to make the insoluble nearly tasteless quinine tannate. The water precipitates the resinous matter from the tincture. A "Shake well" label should be put on the bottle.

116.

Menthol and cocaine alkaloid will dissolve in liquid petrolatum but tannic acid will not. In filling this the compounder (Dimmitt, Nat. Drug. 44, 118) used liquid petrox to dissolve the acid. The writer failed to get a good solution in this way and the best he could do was to dissolve the acid in about 20 minims of water, then add five grains of soap, dissolving it, then add the petrolatum and make a shake mixture, but this is not satisfactory.

117.

The resinous matter in the tincture of myrrh is precipitated by the syrup. By adding the tincture to the syrup in small portions and shaking well after each addition the resin comes down in a form in which it can be more readily suspended in the liquid. Tannic acid combines with the morphine to form a compound insoluble in water. On standing the precipitating matter forms into masses, rendering an even dosage difficult. Adding one or two drams of honey directly to the tincture in place of that much syrup helps to keep the precipitated matter finely divided.

118.

The dose of aconitine is entirely too large unless the particular sample to be used has been proved to be comparatively inert. Two and one half grains of a so-called aconitine have been taken without ill effects, while $\frac{1}{128}$ of a grain has been reported to have caused death. The commencing dose of absolute aconitine should not be much over $\frac{1}{600}$ of a grain. In this prescription there are several physiological incompatibilities. In

action aconitine is more or less opposed to morphine, strychnine, and belladonna. Morphine is to some extent antagonistic to atropine and strychnine, and atropine to strychnine.

119.

The compounder of this prescription stated that the mixture turned pink almost at once. Milk of magnesia is quite strongly alkaline and set free the base adrenalin which is readily oxidized by the air in an alkaline mixture, turning pink. The immediate change in color would rather indicate that the solution used had already become partly oxidized. Adrenalin should not be dispensed in an alkaline mixture without first informing the prescriber that it is quickly rendered inert by alkalies.

120.

Mercuric chloride combines with albumin to form a compound insoluble in water. The presence of an equal weight or more of sodium or ammonium chloride prevents to a considerable extent the formation of the precipitate. "By dissolving one part of corrosive sublimate and a hundred parts of common salt in distilled water and evaporating to dryness a soluble double preparation is obtained which does not coagulate albumen." (U. S. D.) If this prescription were filled as directed it would be practically inert. By adding three or four grains of ammonium chloride to the mercuric chloride, dissolving this in about one half the water and the albumin in the remainder of the water, and mixing these solutions, a nearly clear solution can be obtained.

121.

This prescription was filled by dissolving the inorganic salts in the water and the camphor in the alcohol. The tincture was added to the alcoholic solution and then the two solutions mixed. A turbidity resulted at once, and on standing for some time crystals were formed. This is due to the insolubility of the inorganic salts in the alcohol, which throws them out of their aqueous solution.

be a precipitate of manganese dioxide, there not being enough of acid to convert all into a salt. By adding a grain or two of sodium bicarbonate to neutralize the acid some of the change can be prevented. The directions are: Let them be mixed by vigorous shaking. Label: Let it be applied to the affected parts night and morning.

147.

Bismuth subsalicylate is white, insoluble in the solution and remains suspended for a few minutes. The insoluble matter turns yellow in a few hours, and yellow brown in a few days, continuing to get darker. Some gas is slowly evolved, probably due to the reaction between the hydrogen dioxide and tannic acid.

148.

This mixture gives a nearly black precipitate and a brown black liquid. Several experiments were made to determine what agents caused the change. The hydrogen dioxide, glycerin, and water showed no change on standing several days but when a mixture of these contained zinc sulphate it acquired a yellow to a yellow brown color and became turbid after some time. A mixture of carbolic acid, hydrogen dioxide, water and zinc sulphate begins to color in a few minutes, getting brown black by the next morning. A precipitate forms and increases on standing. Hydrogen dioxide is said to oxidize carbolic acid to pyrocatechin and hydroquinone and to oxidize glycerin to glyceric, oxalic, and tartaric acids. Just what part the zinc sulphate played in this prescription was not determined. It perhaps acted only as a carrier or perhaps as a decomposer of the hydrogen dioxide.

149.

When the two prescriptions are mixed in the proportions as directed the result is almost a mass. Reaction takes place between silver nitrate and potassium iodide, forming the insoluble silver iodide. It is customary to filter all preparations intended to be dropped into the eyes, but in this case the prescriber wanted the solid matter left in. The solution marked

No. 1, containing silver nitrate, began to darken within an hour, due to the reduction of silver. This reduction continued for some time. Solution No. 2 turned yellow in a few days.

150.

The carbonate in the solution of potassium arsenite precipitates the yellow white silver carbonate. The arsenic also combines with the silver, forming yellow silver arsenite, which is insoluble in a neutral aqueous liquid. In this prescription the silver is not all precipitated. The yellow white precipitate becomes dark on standing for a day, with the formation of silver oxide or metallic silver or both. By slightly acidifying Fowler's solution with nitric acid, precipitation can be prevented.

151.

Yellow silver phosphate is precipitated. An organic suspending agent is not admissible because it would reduce the silver. The dispenser can acidify the sodium phosphate with a little dilute nitric or phosphoric acid or the physician should rewrite the prescription.

152.

There will be a little silver permanganate thrown out of solution, it being soluble in 109 parts of water. This salt, like other silver salts, is decomposed by light and also by heat.

153.

When the cocaine is mixed with the solution of silver nitrate it gives a black precipitate of silver oxide. If the cocaine is first dissolved in water with the aid of a little dilute nitric acid, which converts the alkaloid into a salt, the solution can be mixed with the silver nitrate without any precipitation. A better method of filling would be to use the cocaine hydrochloride and follow the directions under No. 213.

154.

The prescriber has plainly indicated that he wishes the extract only as an excipient. The extract should not be used as it

quickly reduces the silver to the metallic form. The silver nitrate should be powdered and then massed with petrolatum or wool fat and kaolin, using kaolin also as a dusting powder. Wool fat makes a more adhesive mass than petrolatum.

155.

Powdered opium reduces silver nitrate quickly. The silver nitrate can be massed with some petrolatum and kaolin and put into No. 5 capsules and these together with the opium into larger capsules.

156.

When silver oxide and creosote are triturated together there is great danger of an explosion. It has been proposed to mix the creosote with powdered soap and then with the oxide, which has been previously mixed with liquorice root. The mass should not be rubbed hard and should be kept cool.

157.

In making Fowler's solution the excess of potassium bicarbonate used is changed to the carbonate by boiling and the carbonate makes the solution alkaline. Potassium carbonate precipitates a solution of mercuric chloride as the basic mercuric chloride. In this prescription there may be a red brown precipitate of the oxychloride of mercury but more generally a white precipitate of calomel forms. An arsenite in an alkaline solution reduces mercuric chloride to mercurous chloride and in excess to metallic mercury. Had the prescriber used the solution of arsenous acid instead of potassium arsenite no trouble would have resulted. The compounder should neutralize the [illegible] solution with hydrochloric acid before adding to the solution of mercuric chloride.

158.

[illegible] chemical reactions take place, depending on the [illegible]. The quinine sulphate is not all dissolved by [illegible]. The sodium salicylate combines with the quinine [illegible] the nearly insoluble quinine salicylate. 2. The

quinine sulphate forms with the mercuric chloride a double compound which is insoluble in water but soluble in alcohol. In this particular instance there is not enough of alcohol in the elixir to dissolve it. 3. The quinine is also precipitated as the free alkaloid by the alkali in Fowler's solution. 4. An alkaline solution of potassium arsenite reduces mercuric chloride to calomel, but in this prescription there is not enough to make any trouble. In filling this, quite a bulky precipitate results. The Fowler's solution should be neutralized with a little acid.

159.

If the solution of dialyzed iron has been improperly made and is strongly acid no precipitation occurs. But if it is nearly neutral, as it should be, ferric hydroxide is precipitated by the alkali that is in Fowler's solution. The ferric hydroxide forms with the arsenic an insoluble compound of basic ferric arsenite, which to some extent changes to ferrous arsenate. Though liquid at first the mixture may gelatinize after several days.

160.

Different results are obtained, according to the order of mixing the ingredients. If the Fowler's solution is added to the solution of dialyzed iron ferric hydroxide is precipitated, and this combines with the arsenic to form an insoluble basic ferric arsenite. But if the syrup is added to the iron and the Fowler's solution is diluted a little with water and then added to the iron, little or no precipitation takes place. Sugar to some extent acts as a solvent for the ferric hydroxide. Solution of dialyzed iron varies considerably in the amount of acidity which it has; if properly made it is nearly neutral. Some samples are sufficiently acid to prevent any precipitation by Fowler's solution. There is some danger of the strychnine being precipitated by the alkali in the Fowler's solution. Syrup or water added to the tincture of cinchona causes a turbidity. The tannin in the tincture will make a black mixture with the iron. To avoid the precipitations noted above the solution of potassium arsenite should first be neutralized with hydrochloric acid. The

directions translated into English are: Mix. Label: Let a teaspoonful be taken after dinner.

161.

According to the National Formulary, Hall's solution of strychnine contains $\frac{1}{16}$ of a grain of strychnine acetate to the dram, together with some acetic acid. Fowler's solution contains, besides the potassium arsenite, some potassium bicarbonate or carbonate (formed by the boiling of the bicarbonate in water). This carbonate will react with the acetic acid, liberating a little carbon dioxide and forming potassium acetate. If there is an excess of the alkaline carbonate the strychnine will be liberated as the free alkaloid. The strychnine will not be precipitated, however, as it is soluble in 136 parts of alcohol, and the prescription can be filled without difficulty.

162.

As this prescription is written it would make a dangerous mixture. The solution of potassium arsenite, being alkaline, slowly precipitates the strychnine. If the solution of arsenous acid were directed instead of Fowler's solution there would be no danger and the physiological effect would be the same. The Fowler's solution should be neutralized before using.

163.

If the Fowler's solution is added to the tincture of nux vomica the alkali in the solution will liberate the free alkaloid strychnine, but it will be held in solution by the alcohol until the infusion is added. With the addition of most infusions the alkaloids would be precipitated, but the infusion of cinchona contains sulphuric acid, which combines with the alkaloids, forming a soluble salt. The water of the infusion will precipitate some of the inert matter from the tincture.

164.

The difficulty is to get the arsenous acid into solution. Hynson (Bul. Pharm., xx. 301) suggests the use of the component

parts of the tincture, which are alcohol and solution of ferric chloride. By dissolving the arsenous acid in the solution of iron and then adding the alcoholic solution of the bichloride and strychnine a clear solution is obtained. This is a principle that can be used to great advantage sometimes.

165.

The dose of the arsenic and of the strychnine is between $\frac{1}{7}$ and $\frac{1}{8}$ of a grain in this prescription. The maximum dose of each, as generally given, is not over $\frac{1}{10}$ of a grain. The prescriber should be consulted. Moreover, each pill would contain about seven grains of medicinal matter, which, considering the bulky quinine sulphate and extract of gentian, makes a very large pill. Where such a large pill is prescribed, twice as many pills are sometimes made as directed and then the number to be taken at one time is doubled.

166.

The potassium carbonate is deliquescent. It should be powdered with some absorbent powder, such as althæa, and then the arsenic, previously triturated with some sugar of milk, added. Next add the mass of iron and if necessary a little water. The pills should be dispensed in a bottle protected from the atmosphere otherwise they will become soft.

167.

Atropine sulphate is nearly insoluble in fixed oils. The free alkaloid is soluble in about 38 parts of olive oil, and this is what should be used in filling this prescription. The physician should be notified of the change.

168.

This mixture is slightly acid, the salicylic acid more than neutralizing the alkalinity of the borax. A little precipitate slowly forms on account of the boro-salicylic acid acting on the alkaloids. This prescription should not be dispensed on account of the excessive doses of atropine and strychnine.

169.

In medium-sized medicinal doses morphine and atropine are physiologically incompatible. But the minute dose of atropine in this prescription assists rather than diminishes the action of morphine by relieving the cardiac depression, indigestion, and constipation.

170.

No apparent change takes place at first but in less than four hours a yellow brown precipitate of metallic gold forms. The arsenous acid reduces the gold chloride. It is also easily reduced by many other inorganic compounds as well as by organic matter and light.

171.

The tincture of iodine contains iodine and potassium iodide dissolved in alcohol. Reaction takes place between the gold chloride and the potassium iodide. "Potassium iodide, added in small portions to a solution of auric chloride (so that the latter is constantly in excess where the two salts are in contact), and when equivalent proportions have been reached, gives a yellow precipitate of aurous iodide, AuI, insoluble in water, soluble in large excess of the reagent; the precipitate is accompanied with separation of free iodine, brown, which is quickly soluble in small excess of the reagent as a colored solution. But on gradually adding auric chloride to solution of potassic iodide, so that the latter is in excess at the point of chemical change, there is first a dark green solution of potassio-auric iodide, $KIAuI_3$; then a dark green precipitate of auric iodide, very unstable, decomposed in pure water," forming the yellow aurous iodide. (Prescott and Johnson's Qualitative Chemical Analysis, 6th ed., 92.) Probably the organic matter present also tends to the reduction and precipitation of the gold. The physician should be notified of the change which takes place. Only a very small amount of menthol is dissolved.

172.

Gold and sodium chloride precipitates the sulphates of atropine and strychnine and the alkaloids in cinchona. There

is about thirty per cent of alcohol present but not enough to prevent precipitation. By dissolving the gold and sodium chloride in water and adding an equal weight of sodium thiosulphate a compound is formed that does not precipitate the alkaloids from this mixture. The gold may be reduced on standing for some time. Water precipitates inert matter from the fluidextract. Atropine and strychnine are somewhat antagonistic in their physiological action.

173.

Sodium bicarbonate is used in making the solution of saccharin, and while this solution makes a clear one with the strychnine at first yet on standing over night the strychnine is precipitated. There is not enough of alcohol in the saccharin solution to prevent it. The strychnine frequently adheres to the sides of the bottle, but may be loose, and in that case an overdose is liable to be taken.

174.

When the first two ingredients are rubbed together a liquid is produced, and this mixed with the lard makes a very thin ointment in warm weather. The prescription was filled by replacing one half the lard by that amount of simple cerate. Rubbing the ingredients with separate portions of lard and then these together seems not to prevent the reaction between the exalgin and naphthol.

175.

An old specimen of bismuth and ammonium citrate is generally not entirely soluble in water unless a little ammonia water is added. At best the solution of this salt is usually slightly alkaline, and the pepsin on being added to this is rendered inert by the alkali. If, however, the hydrochloric acid is used in dissolving the pepsin in water and this solution added to the bismuth and ammonium citrate dissolved in the balance of the water, the action of the pepsin will not be destroyed, but a precipitation will take place. This precipitate is bismuth citrate, the hydrochloric acid breaking up the double salt and combining

with the ammonia. Pepsin should not be prescribed with bismuth and ammonium citrate, as one or the other loses much of its activity. By using four fluid drams of the N. F. glycerite of bismuth about the same amount of bismuth is taken. This glycerite is acid to litmus and can be mixed with pepsin without injury to the pepsin but hydrochloric acid cannot be added to the glycerite without precipitating the bismuth.

176.

The bismuth subnitrate is not dissolved. The aromatic spirit of ammonia precipitates the zinc as zinc carbonate, due to the presence of ammonium carbonate. The carbonate may be slowly decomposed by the bismuth subnitrate, liberating carbon dioxide, which might burst the bottle if tightly corked. Syrup is sufficiently viscid to keep the insoluble matter in suspension while pouring out a dose. A "Shake well" label is necessary.

177.

In massing these two chemicals with an excipient containing water reaction takes place, with the liberation of carbon dioxide, which causes the mass to swell to several times its original size. This reaction goes on slowly, requiring several hours for completion, and the mass should not be made into pills until the reaction has been completed. By using glycerite of starch little or no trouble is experienced.

178.

The bismuth subnitrate is insoluble in the syrup, but a chemical reaction takes place between it and the hydriodic acid, as is evidenced by the change in color. Bismuth subnitrate is white; on mixing it with the syrup the color becomes yellow and quickly turns to a grayish black. According to Watts' Dictionary, the oxyiodide of bismuth is copper-colored and the bismuth iodide is a brilliant gray.

179.

The tragacanth is best rubbed up with one fourth to one half of the water gradually added until the lumps are all rubbed out.

Then rub in the quinine, bismuth, and iodide, and lastly the rest of the water. This makes a thick yellowish mixture. Potassium iodide in the above proportions gives a yellow iodide of bismuth and the mixture becomes orange on standing. Ordinarily bismuth subnitrate with mucilage of tragacanth gives stringy masses but filled as above these are rubbed out. One half the amount of tragacanth called for will be sufficient to suspend the bismuth.

180.

There is some danger of causing an explosion in mixing these two chemicals. Even on mixing them in smaller amounts the chemical reaction is quite violent. There are white fumes given off and the mixture is turned brown. The odor of chlorine is soon lost. Chlorine oxidizes glycerin to oxalic and carbonic acids with intermediate products.

181.

When camphor and carbolic acid are brought together a liquid results. In order to avoid making any more liquid than was necessary the corresponding amount of solid iodine was used in place of the tincture. The iodine dissolved readily in the phenol-camphor liquid and then the powdered lead acetate was added. Kaolin was tried as an absorbent excipient, but the amount required made the pills entirely too large. Starch was then used together with some glucose syrup so as to form the easily decomposed iodide of starch. This made the pills very large and they were finally put into capsules.

182.

This prescription can be filled in one of two ways. The chloral hydrate may be dissolved in the water, and the camphor powdered and mixed with the syrup and then with the solution of chloral. The camphor will rise to the top. Or the camphor may be triturated with the chloral hydrate until liquefied, and this shaken with the syrup and water. The oily chloral-camphor does not dissolve in the water, but seems to be decomposed by it, the chloral going into solution and the

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186.

This was filled by dissolving the sodium bicarbonate, borax, salicylic and benzoic acids in water. The thymol and menthol were rubbed together until a liquid resulted; then the eucalyptol, the glycerin, and the oil of wintergreen were added. To this was added the first solution. After allowing the mixture to stand an oily liquid separated, rising to the top. Effervescence is due to a reaction between the bicarbonate and the salicylic, benzoic, and boric acids, the latter being formed by the action of glycerin on borax. Eucalyptol makes a clear mixture with glycerin, but is separated on the addition of water. The oily liquid formed by the menthol and thymol does not make a clear solution with glycerin, nor does the oil of wintergreen; and whatever of these may have been dissolved by the glycerin is thrown out of solution by the water. A "Shake" label is necessary.

187.

The bottle containing this mixture burst, due to the liberation of carbon dioxide. Solutions of magnesium sulphate and potassium bicarbonate when shaken together give carbon dioxide. It is also liberated by the iron salt which is often a little acid. This makes a clear solution at first but on standing a reddish precipitate forms and adheres to the bottle. An occasional shaking for an hour or two before sending out this prescription will get rid of much of the gas.

188.

Rhubarb contains considerable tannic acid. If water is a part of the excipient, the pills are liable to swell on account of slow liberation of carbon dioxide. If glycerite of starch or similar excipient is used no trouble will be experienced.

189.

The syrup of garlic contains acetic acid, which combines with the ammonium of the ammonium carbonate, liberating carbon dioxide. The reaction should be completed before the

bottle containing the solution is corked, or the pressure of the gas formed may be sufficient to burst the bottle.

190.

The wine of pepsin of the National Formulary contains hydrochloric acid and the syrup of ipecac contains acetic acid. There is a sufficient amount of ammonium carbonate to neutralize both of these acids and render the solution alkaline, thereby destroying the activity of the pepsin. In the reaction carbon dioxide is given off and the bottle must not be corked until the reaction is complete, for the pressure of the gas might burst the bottle.

191.

If the first two ingredients are dissolved in separate portions of the elixir and then mixed a clear solution results. This, however, becomes turbid in a few minutes, and the liquid separates into two layers, the upper one having somewhat of an oily appearance. This oily liquid is chloral alcoholate, formed from the chloral hydrate and the alcohol of the elixir. Just what part the potassium bromide takes in the reaction seems not to be well understood, unless it be to render the alcoholate less soluble in the elixir. Other inorganic salts, such as sodium bromide or sodium chloride, act in a similar way. If there is not more than about ten grains of chloral hydrate and ten grains of potassium bromide in a dram of the solution there is but little danger of the chloral alcoholate separating. Chloral alcoholate is more soluble in alcohol than it is in water, and by the addition of a little more alcohol the separation of the two fluids can sometimes be prevented. This prescription when filled as written may be considered a dangerous one. Several cases have been reported where alarming symptoms have been caused by the taking of a teaspoonful of chloral alcoholate. On filling a similar combination, if a turbidity results the mixture should be kept until it can be determined whether there will be a separation into two layers, and if so, then remedied by adding a little alcohol or putting on a "Shake well" label.

192.

Rubbing chloral hydrate and quinine sulphate together in a mortar gives a sticky mass which is insoluble in water. Rubbing them together in the presence of water gives about the same result. By dissolving the chloral and bromide in water and then adding the quinine a mixture is produced which on standing gets almost too thick to pour.

193.

When the first two ingredients are rubbed together in a mortar chemical reaction takes place with enough violence to amount almost to an explosion, and there is an evolution of a large volume of white fumes. If the two chemicals are powdered separately and then mixed together lightly the change is slower and the mixture gradually turns brown. If mixed with separate portions of the cerate and then these mixed the reaction is retarded, but the ointment ultimately becomes brown. Chloral hydrate and potassium cyanide form dichloro-acetic acid, and in concentrated solutions form a crystalline compound which is not very soluble in water (M. & M., II. 4).

194.

Chloral hydrate rubbed with phenacetin gives a liquid, a sticky mass is also obtained when chloral hydrate is rubbed with quinine sulphate. The phenacetin and quinine can be mixed and put into the capsules and then the chloral hydrate. Absorbent powder is hardly admissible, as each capsule contains fifteen grains of medicinal matter.

195.

The trouble in filling this prescription comes in getting the extracts into solution. The best way is to make a very strong aqueous solution of the chloral hydrate and this will dissolve the extracts; to this solution add the alcohol and then the water containing the bromide, the latter solution to be added slowly with constant stirring. Some precipitate will form but it can be readily diffused through the liquid by agitation.

196.

The amount of chlorine formed will depend upon the order of mixing the ingredients. If the potassium chlorate and hydrochloric acid are mixed and then the water added a yellow liquid containing much free chlorine with oxides of chlorine will result. If, however, the salt is first dissolved in water and then hydrochloric acid added the amount of chlorine formed will be small. The physician should indicate which is wanted.

197.

If the ingredients are powdered separately and then mixed lightly together there will probably be no danger of explosion, and no chemical reaction will take place while the powder is dry. But when taken into the stomach the potassium chlorate with the hydrochloric acid of the gastric juice may oxidize the calomel, forming mercuric chloride. Although this may be considered a rather dangerous prescription it has been filled and taken without apparent ill effect.

198.

There is considerable danger of having a sudden production of gas in attempting to fill this and there have been such cases reported, although it has been dispensed many times. If the potassium chlorate is rubbed with the glycerin explosion is liable to take place. Or if the chlorate be added to the solution of ferric chloride, which always contains some free hydrochloric acid, chlorine will be formed, and this will act upon the glycerin, converting it into oxalic and carbonic acids. In filling this the temperature should not go above 70° F., and then the bottle should be loosely stoppered for a time before giving to the patient. The chlorate is not entirely dissolved.

199.

Tincture of iron if not too strongly acid will give a color varying from a blue to a dirty green with morphine. This color is destroyed by excess of acid or by alcohol. This prescription will give a bluish green mixture, which will turn to a yellowish orange in a day or two. This latter change is prob-

ably due partly to the slow formation of chlorine by the action of the hydrochloric acid in the tincture on the potassium chlorate. Chlorine turns a morphine solution orange color. There is not enough water to dissolve all of the chlorate.

200.

A clear solution was obtained which had at first a dark violet color. The color soon changed to brown, and in a few hours a dark brown precipitate began to form. The amount of precipitate continued to increase for some time. It was filtered out, thoroughly washed with water, and heated with water acidulated with hydrochloric acid; part went into solution and part remained undissolved. The filtrate showed the presence of iron. The part left undissolved is probably some oxidation product of carbolic acid, produced by the chlorine liberated by the acid in the tincture acting on the potassium chlorate.

201.

There is a sufficient amount of water to dissolve the potassium salts and the solution remains clear for a time after the spirit is added. It is not long, however, before crystals begin to separate. The alcohol in the spirit throws the potassium chlorate out of solution.

202.

Each ingredient should be powdered separately and then mixed lightly with the other. If the two are rubbed together with some force slight crackling explosions take place. A sharp blow would probably cause serious results. The patient should be cautioned. With a little care on the part of the pharmacist and patient no ill results will follow from this combination.

203.

If the directions to rub these solids together be followed an explosion will probably result. Potassium chlorate forms an explosive mixture with each of the three other ingredients. Each substance should be powdered separately and all mixed together lightly. Some pharmacists would decline to fill this

prescription. If filled, however, the patient should be informed of the nature of the mixture and cautioned to keep it where there will be no danger of its receiving a blow between two hard surfaces.

204.

Sodium bicarbonate requires 10 parts of water for solution. While there is sufficient water to dissolve the two salts and the acid, a precipitate very slowly forms after the addition of the chloroform, due, probably, to the throwing out of solution some of the bicarbonate by the chloroform. The chloroform is not all dissolved, but sinks to the bottom. In dissolving sodium bicarbonate in water heat should not be used, because carbon dioxide is liberated, forming the normal sodium carbonate. Carbolic acid does not liberate carbon dioxide from the sodium bicarbonate.

205.

The oil, chloroform, spirit of camphor, and aromatic spirit of ammonia mixed make a clear solution, but on the addition of the tincture and the whiskey the oil and chloroform are thrown out of the solution, and on standing the mixture separates into two clear layers the lower one being chloroform and oil. There is no danger of the morphine being precipitated, for, although the free alkaloid is formed by the ammonia, there is enough of alcohol and chloroform to keep it in solution. A "Shake well" label should be used.

206.

A mixture of thymol, alcohol, and ammonia is colorless at first, but acquires a decided though not deep green color on standing for a week. If the chlorinated soda solution is added to a mixture of thymol, alcohol, and ammonia a light green clear solution is formed at once. Within ten minutes this becomes slightly turbid and of a deep green color. On allowing it to stand a day an oily fluid separates from the dark green solution in little round globules. These globules are black in appearance, but when broken up into very small ones they are blue red or purple

in color. This oily liquid has nearly the same specific gravity as the aqueous liquid.

207.

This mixture quickly becomes blue, the color gradually deepening, and a turbidity is produced. The addition of an acid turns it red. Mention is made of this change in Allen's Organic Analysis, and also in Muir and Morley's edition of Watts' Dictionary (vol. III., p. 832), but no explanation is given nor intimation of the chemical change which takes place.

208.

The chromic acid and cocaine hydrochloride were dissolved in separate portions of water, using one dram for each, and these solutions were mixed. A heavy yellow sticky precipitate formed which made a mass. It is necessary to use about twelve drams of water to get a clear solution and then it may precipitate on standing for a time. Alcohol or glycerin cannot be used with chromic acid. The prescription cannot well be dispensed as written.

209.

Chromic acid oxidizes glycerin to oxalic and carbonic acids; it oxidizes alcohol to aldehyde and acetic acid. There is great danger of causing an explosion or igniting the organic matter in filling this prescription. The reaction is very violent. The chromic acid is changed to an insoluble oxide of chromium. The prescription should not be filled.

210.

Salicylic acid and resorcin dissolve in the collodion. Chrysarobin only partially dissolves and is difficult to mix with collodion after standing in the bottle for a time. It requires 16 parts of ether and 385 parts of alcohol for solution.

211.

When calomel and cocaine hydrochloride are triturated together a gray mixture results. Probably a part of the calomel is reduced to metallic mercury, which gives the gray color, and

another part is oxidized to mercuric chloride. As the amount in each pill of the mercuric chloride formed is within the limits of the dose of that substance, the pills may be dispensed. It would be well, however, to inquire the age of the patient and the frequency of the dose. By the addition of about five grains of starch or liquorice root and a little water a suitable pill-mass can be made, the pepsin giving sufficient adhesive qualities.

312.

Cocaine hydrochloride is insoluble in ether and soluble in [illegible] parts of alcohol. As solution is made up of [illegible] volumes of ether to [illegible] of alcohol, this salt will not dissolve in it. The free alkaloid cocaine is readily soluble in alcohol or ether, and consequently in solution and this should be used.

313.

Mixing a solution of silver nitrate with a solution of cocaine hydrochloride produces a white precipitate of silver chloride. If this is filtered out about one half of the silver is removed. The pharmacist should use cocaine nitrate. If he does not have it he can make it by dissolving the one grain of cocaine hydrochloride in a little water and adding one half a grain of silver nitrate in a little water. This makes cocaine nitrate and silver chloride. The precipitate can then be filtered out and the requisite amount of silver nitrate added.

314.

The trouble with this prescription is to get into and to keep in solution the two alkaloidal salts. Cocaine hydrochloride is soluble in [illegible] parts of water, [illegible] parts of alcohol, [illegible] parts of chloroform, and insoluble in ether. Morphine sulphate is soluble in [illegible] parts of water, [illegible] parts of alcohol, and nearly insoluble in ether or chloroform. The alcohol in the mixture is not present in sufficient amount to dissolve all of the morphine sulphate, and the ether and chloroform would throw out about all that the alcohol dissolves. As a rule, the free alkaloids are much more soluble in ether or chloroform than are their salts, but mor-

phine is an exception. Morphine dissolves in 210 parts of alcohol (not enough in the two ounces of the tincture to dissolve the amount that would correspond to 15 grains of the sulphate), in 6250 parts of ether, or 1220 parts of chloroform. It is impossible to get the morphine sulphate or the free alkaloid into solution. The prescription should not be dispensed.

215.

Camphor and menthol dissolve in liquid petrolatum; cocaine hydrochloride does not dissolve. The free alkaloid cocaine should be used as it is soluble in the liquid petrolatum called for.

216.

Cocaine alkaloid is somewhat soluble in liquid petrolatum, requiring about 75 to 100 parts, but not in the proportion given in this prescription. The compounder (Dimmitt) filled it by dissolving the alkaloid in a little oleic acid and adding this to the liquid petrolatum with which it makes a clear mixture. Using forty-five minims of acid with a little heat gives a good preparation.

217.

Evidently the prescriber wished to air a little of his knowledge or then had some kind of an agreement with a certain pharmacist to fill his prescriptions. It is unusual to employ the chemical symbols in writing prescriptions, and it can hardly be expected that the dispenser will know and remember such complicated formulas as the first one and of a compound which is used comparatively seldom. $C_{18}H_{21}NO_3$ is codeine, KI is potassium iodide, $C_3H_8O_3$ is glycerin, and H_2O is water.

This prescription was filled by dissolving the codeine in the glycerin and part of the water. The iodide was dissolved in the remainder of the water and the two solutions mixed, without any precipitation occurring at once. After several days, however, there was a deposit of very fine crystals. Potassium iodide precipitates quite a number of the alkaloids from their solutions. This precipitation can be prevented by having a small amount of alcohol present.

218.

Codeine is strongly basic and liberates ammonia from a solution of ammonium chloride. This can be readily proved by suspending wet red litmus paper in the bottle over the liquid. Codeine also liberates morphine from its salt, so that in the presence of the ammonia which is formed in this prescription there is some danger of the morphine being precipitated. A slight precipitate makes its appearance after some hours and gradually increases, but the morphine is not nearly all thrown out of solution. A salt of codeine, as the sulphate, should be used.

219.

This mixture makes a solid mass which cannot be applied with a brush. A gelatinous mass which possibly might be applied with a brush is obtained when one half of the collodion is replaced by alcohol.

220.

The tincture of iodine and the collodion mix without any trouble or any reduction of the iod'ne even on standing for several days. If the tincture of iodine contains an iodide as the U. S. P. tincture now does, no coagulation is produced on adding ammonia water. If the tincture is a solution of iodine in alcohol without an iodide the collodion is coagulated and on adding ammonia this goes into solution in a day or two. The ammonia changes the iodine to ammonium iodide chiefly and a small amount of ammonium iodate. When there is a deficient amount of ammonia some explosive iodide of nitrogen is liable to be formed. This prescription becomes nearly or entirely colorless in a few days.

Sometimes equal volumes of tincture of iodine, collodion, and stronger ammonia water are prescribed. In this case some coagulum is formed but dissolves in a few hours and the solution becomes yellow by the next day. The coagulum is the gun-cotton thrown out of solution.

221.

The copaiba when mixed with the tinctures does not make a clear solution, as it requires from three to four times its amount of alcohol, although it is readily soluble in absolute alcohol. On the further addition of glycerin the mixture was made more turbid and the syrup when added threw out of solution most of the copaiba, which had been dissolved by the alcohol of the tinctures. On standing the copaiba rises to the top, but the syrup and glycerin are viscid enough to hold it in suspension for some little time, so that the patient can get a uniform dose. It should be dispensed with a "Shake well" label.

222.

All of the ingredients except the syrup can be mixed without producing much turbidity. But on adding the syrup to this mixture the resinous matter from the fluidextract and tincture is precipitated, and the copaiba, oil of turpentine, and camphor are separated. To make a presentable mixture some emulsifying agent must be used.

223.

An absorbent excipient is necessary in order to make a pill-mass. To use a powder like liquorice root or althæa would make the pills too large. Freshly calcined magnesia dampened with a little water is the best, as it is only necessary to use six or eight grains. The magnesia combines with the copaibic acid in the oleoresin to form a solid mass; a little water aids the reaction and it may be necessary to use the heat of a water-bath. The N. F. mass of copaiba can be used.

224.

A mixture of these ingredients quite quickly separates into two layers, the lower one being about one fourth the total volume. There is not sufficient alcohol to dissolve the other liquids. There is no effervescence at first, but if the bottle is tightly corked it may be burst by the gas which is slowly evolved,

in an aqueous solution of potassium iodide is a general alkaloidal reagent and precipitates the quinine. Neutralizing the solution will prevent liberation of iodine for a time, or using the soluble iron and quinine citrate. The presence of a citrate retards liberation of iodine so that it is not liberated to such an extent in this prescription as it would be with ferric chloride.

238.

In a neutral solution potassium iodide does not react with the tartrate of iron and potassium, but in the presence of the sulphuric acid the ferric salt oxidizes the iodide, liberating iodine. This iodine then combines with the quinine to form an insoluble compound. A "Shake well" label is necessary. If there were much more free iodine than would combine with the quinine the prescription should not be dispensed.

239.

Adding the tincture to the syrup produces a gelatinous precipitate which dissolves on adding the acid. The precipitate is ferric hypophosphite which is decomposed by the phosphoric acid forming ferric phosphate which is soluble in excess of acid. If the prescriber had used hydrochloric acid instead of the phosphoric the precipitate would not have dissolved, the iron having a stronger affinity for the hypophosphorous acid than for hydrochloric but less than for the phosphoric. Syrup of hypophosphites does not give a precipitate with tincture citrochloride of iron.

240.

Although the Fowler's solution is alkaline, there is enough of acid in the prescription to prevent any precipitation by it. The insoluble ferric phosphate or hypophosphite is thrown down. By using the tincture of citro-chloride of iron no precipitation results at once, but does after a day or two. If it were admissible to use twice as much phosphoric acid as tincture of iron there would be no precipitation.

229.

This prescription would make pills weighing nearly eight grains each even though no excipient is used, and as two of the ingredients are liquids, it would require a large amount of an absorbent powder to make a mass and the pills would be entirely too large. A smaller amount of excipient can be used, and at the same time a larger amount of medicinal matter can be taken, in the form of capsules than in a pill. This prescription should either be put into capsules or be made into two or three times as many pills as directed, of course increasing the number to be taken at a dose.

230.

The difficulty with this prescription is that triturating the salicylic acid with the exalgin produces a soft sticky mass which is unfit for dispensing in powders. Even by mixing all of the other ingredients except the acid and adding it last and then mixing lightly on paper the mixture becomes sticky. By diluting the acid with twice its weight of powdered althæa and then with the other ingredients a fair powder can be obtained. Probably the best way would be to put the ingredients into capsules, separating the acid from the exalgin by the phenacetin and cocaine, if the mixture is to be used internally.

231.

This combination has perhaps caused more trouble than almost any other one prescription. The U. S. P. phosphate of iron may be a double compound of sodio-ferric citro-phosphate or it may be a mixture of ferric phosphate and sodium citrate. If it is the double compound (and there are reasons for thinking that it is) the phosphoric acid decomposes it, precipitating the phosphate of iron. If it is a mixture the explanation given is that the sodium citrate is readily soluble in water and an aqueous solution of it is a good solvent for the ferric phosphate. Now when phosphoric acid is added it is supposed that the sodium citrate is decomposed, forming sodium phosphate and citric acid; the ferric phosphate, being

no longer soluble in this solution, is precipitated. This difficulty can be overcome by using strictly pure dilute metaphosphoric acid (known also as glacial phosphoric acid) in place of the official orthophosphoric acid. A solution of metaphosphoric acid changes in time, forming some orthophosphoric acid, and if the meta-acid contain some of the ortho-variety a precipitation will occur. The dispenser must decide for himself as to the substitution proposed. There is sometimes, however, another difficulty present in this combination of ingredients. When quinine sulphate is present in a much larger proportion than two grains to the dram a precipitation of the quinine by the ortho- or the meta-acid takes place, and there seems to be no way to make a permanent solution.

232.

Pure ferric pyrophosphate of iron is insoluble in water. The official soluble pyrophosphate of iron may be a double compound of sodio-ferric citro-pyrophosphate, or it may be a mixture of ferric pyrophosphate and sodium citrate, the former being soluble in a solution of the latter. When sulphuric acid is added to the solution of this compound or mixture the ferric pyrophosphate is precipitated, the sulphuric acid probably combining with the sodium and liberating citric acid. The quinine is not precipitated.

233.

This makes a clear prescription at first, but on standing a precipitate begins to form in a few hours and continues for some time. The appearance of the precipitate is that of iron pyrophosphate. It has been suggested that potassium acetate salts out the iron pyrophosphate. Precipitation can be prevented by making the elixir slightly alkaline with ammonia.

234.

In neutralizing tincture of ferric chloride by adding ammonia water to it a precipitate is formed, consisting of ferric hydroxide and basic ferric chloride. If the ammonia water is added to a part of the syrup, and then this added to the tinc-

ture of iron previously diluted with the balance of the syrup, no precipitation will occur even though an excess of ammonia is used. The resulting fluid is of a very dark red color. The syrup acts as a solvent for the ferric hydroxide. It is better to add a strong solution of ammonia than a weak one, as the water dilutes the syrup so much that it may not prevent the precipitation.

235.

No matter what order is used in mixing these ingredients a clear solution cannot be obtained. Several chemical reactions are liable to take place. 1. Potassium acetate with tincture chloride of iron gives a red solution of ferric acetate. 2. Potassium acetate with a solution of quinine sulphate gives the almost insoluble quinine acetate. 3. Sodium bicarbonate precipitates morphine from a solution of its salt. 4. Sodium bicarbonate precipitates ferric hydroxide from the tincture of iron. 5. Sodium bicarbonate precipitates the quinine from a solution of the sulphate. 6. The morphine sulphate gives a blue green solution with the tincture of iron. By replacing one half of the water with glycerin the precipitation can be prevented to some extent.

236.

The sodium phosphate gives a white gelatinous precipitate of ferric phosphate. Phosphoric acid will redissolve it but the amount of acid required is too large to use. If tincture citrochloride of iron is used in place of the U. S. P. tincture no precipitate results on account of the citrate present. An alkali citrate in solution is a good solvent for salts of iron which are insoluble in water.

237.

On mixing solutions of the first two ingredients a reaction takes place, with the formation of free iodine and a reddish brown precipitate. The aqueous solution of iron and quinine citrate is acid, and ferric salts in acid solutions with potassium iodide are reduced to ferrous compounds, iodine being liberated. Iodine

boric acid with sodium bicarbonate gives sodium borate and carbon dioxide. Other polyhydric alcohols, such as mannitol, dextrose, levulose, and glucose, act like glycerin in decomposing borax. [See GLYCERIN No. 1.]

254.

On adding a part of the glycerin to the balsam a nearly solid mass results which is thinned some by the balance of the glycerin so that it will run slowly. There may be some chemical reaction, but more probably the thickening is due to the separation of part of the resinous matter. On standing exposed to the air the glycerin absorbs moisture and the mixture becomes thinner, the balsam coming to the top. The odor of the iodoform is destroyed, the balsam combining with the iodoform (U. S. D.).

255.

The trouble with this prescription is that the water breaks up the boroglycerin, liberating boric acid. Boric acid requires about 18 parts of water for solution, and there is not enough to dissolve it. By replacing one half of the water with glycerin no precipitation results, boric acid being soluble in about 4 parts of glycerin.

256.

The glycerite of boroglycerin which is called for can be mixed with the vaselin, but it separates on standing. Using lanolin in place of vaselin no separation occurs.

257.

The best way to fill this prescription is to dissolve the corrosive sublimate in the glycerin mixed with a half dram of water. Then to this solution add *all at once* the syrup of lime. A yellow precipitate is formed at first, but this quickly disappears and a clear slightly yellowish liquid results. A slight light-gray precipitate is formed after standing a day, and this increases slowly for several days. Certain organic substances, such as glycerin, sugar, and gum arabic, have the power of preventing the pre-

cipitation of solutions of some of the metallic salts by alkali hydroxides.

If the syrup of lime is added slowly to the solution of corrosive sublimate a yellow precipitate is formed, but is redissolved again when the water is added. Quite a heavy steel gray precipitate forms within an hour and it slowly increases on further standing. A similar result takes place if the solution of mercuric chloride is added to the syrup of lime.

258.

In filling this prescription each of the salts was dissolved in separate portions of water. The potassium iodide solution was added to the mercuric chloride solution, and at first there was a red precipitate of mercuric iodide, which was dissolved by the further addition of the potassium iodide, forming the soluble potassium mercuric iodide. On the addition of the ammonium carbonate solution to this no change of any kind was noticed. However, when the ammonium carbonate solution was added to the mercuric chloride solution a white precipitate of ammoniated mercury was formed. On adding the potassium iodide solution to this mixture the precipitate disappeared and a clear nearly colorless solution was formed. Probably the ammoniated mercury was decomposed and the soluble double compound of potassium mercuric iodide was formed.

259.

The aromatic spirit of ammonia contains ammonium hydroxide and ammonium carbonate, and these act similarly in precipitating the corrosive sublimate as ammoniated mercury (NH_2HgCl). Ammoniated mercury is soluble in solutions of ammonium salts and somewhat soluble in acids, so that the sulphuric acid in the infusion will redissolve it, though not very readily. The precipitation may be prevented by mixing the infusion and spirit together first. Mercuric chloride precipitates the cinchona alkaloids from their aqueous solutions when not too dilute. The oils in the spirit are thrown out of solution by the

water of the infusion. The directions are: Mix. Label: Teaspoonful twice a day.

260.

The doses of the first two ingredients are too large. The maximum dose of mercuric chloride is about $\frac{1}{6}$ of a grain and of sodium arsenate about $\frac{1}{8}$ of a grain. The prescription should not be dispensed without first consulting the prescriber. Should it be filled the potassium carbonate will react with the strychnine, the mercury, and the iron salts, but the activity is not increased.

261.

The quinine sulphate was dissolved in the tincture of iron with the hydrobromic acid and then an aqueous solution of the corrosive sublimate added. A precipitation commenced at once and continued for some time. Mercuric chloride is a general alkaloidal reagent, and so also is the double compound that it forms with the hydrobromic acid; these combine with the quinine to form insoluble compounds. In such a prescription as this the danger lies, not in the precipitation of the quinine, but of the mercuric chloride, and in this particular instance it is almost entirely thrown out of solution. This prescription might be considered dangerous to dispense.

262.

Several reactions may occur when the first two ingredients are mixed, depending upon the proportions. A mercuric oxychloride is formed by the carbonate of potassium in the Fowler's solution. Under certain circumstances mercuric arsenite is formed and is dissolved in a solution of potassium arsenite. In the presence of an alkali, arsenites reduce mercuric compounds to mercurous compounds and then to metallic mercury, and the arsenites are oxidized to arsenates. In this prescription a pinkish white precipitate is first formed, consisting of calomel and the coloring matter of Fowler's solution. On further standing it turns dark, due to the reduction to metallic mercury. Fowler's solution added to the quinine sulphate liberates the free alkaloid.

If the prescriber had directed the solution of arsenous acid instead of potassium arsenite there would have been no reduction and but little precipitation. The dispenser should neutralize Fowler's solution before mixing with the other ingredients.

263.

Several reactions are possible. 1. Corrosive sublimate precipitates the strychnine nitrate as a double compound. 2. With Fowler's solution the mercury may first be precipitated as the basic chloride by the carbonate and later reduced to mercurous salt and metallic mercury by the arsenite, the arsenite being changed to an arsenate. 3. Mercuric chloride gives a precipitate with pepsin. 4. It is reduced to mercurous compound and then metallic mercury by the hypophosphites. 5. Strychnine alkaloid is liberated from the nitrate by the carbonate in Fowler's solution. 6. Potassium carbonate in Fowler's solution will give off carbon dioxide with hydrochloric acid in essence of pepsin and if it were in excess would render the pepsin inert. There is enough of acid present to prevent this. 7. Fowler's solution if sufficiently alkaline will precipitate many of the ingredients in the syrup. This prescription can be filled without danger by first dissolving the corrosive sublimate in a little water, the strychnine nitrate in another portion of water; to most of the syrup add the essence and then the Fowler's solution previously neutralized, then the solution of strychnine and lastly the solution of mercury.

264.

The mercuric chloride precipitates the strychnine sulphate as a double compound, which is soluble in a fairly strong alcohol, less soluble in the presence of hydrochloric acid. This prescription deposits a precipitate of long needle-shaped crystals on standing a few hours, but not immediately on filling. If the first ingredient is omitted no precipitation takes place within at least twenty-four hours, although there is danger of precipitation after the patient has received it. The addition of a few drops of hydrochloric acid quickly brings it down. If the mercuric

chloride be omitted there will be but little danger of precipitation. This prescription as written should not be filled, because of the precipitation of strychnine and also because of the large dose of strychnine.

265.

The mercuric chloride and ferrous iodide react to form mercuric iodide and ferrous chloride. The insoluble red iodide of mercury thus formed is redissolved in the excess of ferrous iodide. Creosote is only slightly soluble in water. In this case there is an excess of creosote, and it forms an oily layer on top unless it is emulsified. Occasionally the solution of ammonium acetate is alkaline, and in such a case it might give a precipitate with the mercuric chloride, forming ammoniated mercury, and with the ferrous iodide, forming ferrous carbonate.

266.

This mixture if kept perfectly dry will not change in color, but pepsin is frequently hygroscopic and absorbs moisture in sufficient amount to enable a reaction to take place between the calomel and sodium bromide, causing the powder to turn black. Sodium bromide is deliquescent and in the presence of moisture breaks up calomel, forming a mercuric compound and metallic mercury, the latter giving the dark color. Theoretically one half of the calomel goes to form mercuric chloride, and if this is really so there would be about one fourth of a grain of mercuric chloride to the dose which would be dangerous.

267.

Quinine sulphate and hydrobromic acid give a slight greenish color. By hydrobromic acid a part of the mercurous chloride is reduced to metallic mercury, and a part is oxidized to mercuric chloride, which is much more active than calomel. By adding the calomel last the reaction can be prevented to some extent, and the amount of mercuric chloride formed is probably not dangerous. The directions are: Mix and divide into 10 equal

parts and put into gelatin capsules. Label: One capsule to be taken every three hours.

268.

It is a somewhat disputed question whether in such a prescription there would be any mercuric chloride formed, and if so whether the amount formed would be sufficient to have any disagreeable physiological effect. If the prescription is to be used up in a short time probably no bad results would follow. [See HYDRARGYRI CHLORIDUM MITE, NO. 7.]

269.

"According to M. Mialhe, calomel is partly converted into corrosive sublimate and metallic mercury by ammonium chloride and by sodium and potassium chlorides, even at the temperature of the body." (U. S. Dispensatory, 17th ed., 695.) This is not now generally considered a dangerous prescription. [See HYDRARGYRI CHLORIDUM MITE, NO. 7.] The directions are: Mix and divide into 20 equal parts. Label: Take one powder two or three times a day.

270.

On triturating these two substances together the mixture becomes black. Ammonium carbonate acts like ammonium hydroxide, forming metallic mercury and a mercuric salt. [See HYDRAGYRI CHLORIDUM MITE, NO. 3.] If all of the calomel is thus decomposed there would be over six grains of the mercuric compound and the amount taken in one capsule would be a dangerous dose.

271.

The statement has been made that sodium bicarbonate with calomel forms corrosive sublimate slowly, the change not taking place within four to six weeks ordinarily, so that, except under unusual conditions, any prescription would be used before mercuric chloride is formed. It is a very common practice of physicians to direct the use of these two chemicals together and no ill effect seems to have resulted.

272.

The cherry laurel water of the Br. P. contains 0.1 per cent of hydrocyanic acid. It has been proved that calomel with hydrocyanic acid is changed to mercuric chloride, mercuric cyanide, and metallic mercury. Hydrocyanic acid displaces hydrochloric acid in dilute solutions, while in concentrated solutions hydrochloric acid displaces hydrocyanic acid. There is such a small amount of hydrocyanic acid that there would not be much of the mercuric salts formed.

273.

Reaction takes place between the calcium hydroxide and the mercurous chloride, forming calcium chloride and the black, insoluble mercurous oxide. This is similar to the "black wash" of the National Formulary.

274.

If these three ingredients are mixed in the absence of moisture no change in appearance is noticeable. In the presence of moisture the mixture at once begins to turn gray. This is due to the formation of metallic mercury and mercurous oxide, while at the same time some mercuric chloride is formed (M. R., VII. 492). The sodium bicarbonate seems to play some part in the reaction since calomel and antipyrine with water do not readily darken. This might be considered a rather dangerous prescription, but probably there is not enough of the mercuric salt formed to cause dangerous symptoms.

275.

Potassium iodide decomposes mercurous iodide, making metallic mercury and mercuric chloride, the latter combining with the excess of potassium to make the soluble potassium mercuric chloride. Theoretically there would be formed about 9.4 grains of mercuric iodide. This prescription will measure a little over five fluid ounces, the three ounces of iodide increasing the volume a little over two ounces. There would be approximately eighty doses. The dose of mercuric salt then would not be over the maximum.

276.

This mixture is said to be irritating to the eye due to the reaction between the cocaine hydrochloride and mercuric oxide forming cocaine and mercuric chloride, the latter being the agent that causes the irritation. A soluble mercuric salt is formed. The trouble was prevented by using the free cocaine in a portion of warmed petrolatum.

277.

If the zinc sulphate is dissolved in water, glycerin added and then the ichthyol, a nearly black mass is formed which sticks to the bottle and cannot be shaken up. It is zinc ichthyolsulphonate. If ichthyol and glycerin are mixed in a mortar, then the zinc sulphate added and thoroughly mixed, then a little water and the balance of water in portions, the precipitate separates quickly and after standing forms masses. However, if to the mixture of ichthyol and glycerin, fifteen grains of powdered acacia are added, then the zinc sulphate and lastly the water in portions, rubbing well after each addition, the precipitate remains suspended for some time and can be more easily shaken up.

278.

Although this ointment is brown at first it becomes blue and then greenish black, due to the ichthyol and iodine.

279.

Ichthyol when rubbed with ammonium chloride makes a mass resembling a pill mass and gas is slowly evolved, the mixture remaining neutral to litmus. On adding the phenol, the mass softens and mixes readily with the wool fat. Crystallized phenol when rubbed with ichthyol makes it thinner. This should be filled by mixing the ammonium chloride with wool fat, then adding phenol and lastly the ichthyol.

280.

Ichthyol gives sticky precipitates with most alkaloids. In this prescription as ordinarily filled the precipitate sticks to the

bottle. The ichthyol, quinine and resorcin with about twenty grains of powdered acacia should be rubbed in a mortar, then a little water added in portions, stirring well after each addition. Filled in this way the precipitate remains suspended for some time and can be shaken up.

281.

Ichthyol contains about 50 per cent water, enough so that capsules will be softened if not dissolved. It has been suggested to swab the inside of the capsules with a fixed oil before putting in the ichthyol but this is not always satisfactory in preventing the trouble. The ichthyol can be evaporated some and then a drying powder added to make a stiff mass.

282.

The strychnine and the iodoform are insoluble in the syrups. The strychnine sulphate should be used instead of the alkaloid and then it will dissolve in the syrups. The iodoform should be finely powdered before mixing with the other ingredients and a "Shake" label should be put on the bottle. Very frequently syrup of hydriodic acid contains some free iodine, which would precipitate the alkaloids, but by mixing the two syrups first the iodine is reduced by the hypophosphorous acid in the syrup of hypophosphites. There is perhaps a little danger of the hydriodic acid precipitating the strychnine, as under certain conditions iodides precipitate that alkaloid.

283.

Iodoform dissolves rather slowly in ether and the solution generally gets brown red in a few minutes, deepening on standing. Iodine is liberated. Iodoform dissolves less readily in liquid petrolatum, but this solution slowly acquires a red color and liberates iodine.

284.

So long as this mixture is kept from the light it does not change in color, but on exposure to direct sunlight for a few hours, or to diffused light for a longer period, it acquires a red

color. This is due to the decomposition of iodoform, liberating iodine, and the iodine combines with and oxidizes the calomel, forming mercuric iodide.

285.

No change is noticed in the appearance of this mixture on standing unless exposed to sunlight when it becomes a dirty gray. The odor is still prominent at the end of a month. According to the U. S. D. the odor of the iodoform slowly diminishes, due to the decomposition caused by the tannic acid.

286.

Triturating the iodol with the mercuric oxide caused an explosion, which might have been avoided by mixing the ingredients separately with portions of petrolatum and then mixing these.

287.

Terpin hydrate dissolves in about 200 parts of water and iodol in about 5000 parts of water. These should be finely powdered before mixing with the other ingredients, and the prescription dispensed with a "Shake well" label. The glycerin and syrup are sufficiently viscid to keep the insoluble substances in suspension for a time.

288.

This prescription was filled by rubbing the mercury with the iodine, then adding the glycerin, and lastly the tannic acid. Reaction takes place between the mercury and iodine, forming mercurous iodide and then mercuric iodide. Tannic acid reduces the iodine to hydriodic acid. Considerable red iodide of mercury is precipitated, although some is probably dissolved. This prescription is given in one of the standard works on therapeutics.

289.

One gram of iodine is soluble in about 12.5 Cc. of alcohol. As much of the iodine as possible was dissolved in the alcohol and then the camphor dissolved in this. This solution was then

...urial ointment with constant tri... added last. On standing a few ... formed and the mixture separated ... was this red precipitate, prob... of fatty matter, and on top a ... free iodine. This mixture was ... and applied. On the third day ... peared, leaving the yellow fatty ... red and containing a little free ... liquid was yellowish brown and ... Part of the iodine probably ... form mercuric iodide, and part ... soluble iodide, which dissolved the ... of the iodine probably combined ... and fatty matter. Although the ... much diminished the mixture is ... the mercuric salt formed.

290.

... a bright-red precipitate is ... the iodine color of the liquid is ... or two there is no free iodine ... chemical reactions take place. The ... ssium iodide in the tincture form ... tassium chloride, and metallic mer... with the iodine forms mercurous ... makes the red mercuric iodide. ... some extent upon the proportion ...

291.

... states that when the first two ... explosion takes place, due to the ... By mixing the first two in... ... of lard and then mixing these ... The iodine is reduced and the oint... ... white.

292.

The color of this mixture is brown at first, due to the free iodine. The iodine soon combines with the free oleic acid, forming addition products which are nearly colorless.

293.

The arsenite in alkaline solution reduces the iodine to an iodide while the arsenite becomes an arsenate. About one eighth of the iodine is reduced. Iodoform might be produced on heating the mixture but no odor of it is noticeable in the cold.

294.

The compound liniment of camphor contains ammonia, and this with the iodine forms ammonium iodide and a little ammonium iodate. The mixture at first is red brown, but becomes colorless as the iodine is changed. There is some danger of forming the explosive iodide of nitrogen. [See under IODUM.]

295.

This makes a clear brownish red solution, which on standing two or three days loses much of its color. The color varies with the proportion of free iodine which also varies with the condition of the soap liniment. Soap, oil of rosemary, and camphor all reduce the iodine to some extent. In some cases all of the iodine is changed so that it no longer gives a test with starch. The products formed are not well known.

296.

This mixture on standing separates into two layers, the oil coming to the top. Part of the iodine combines with the oil, but not all. Probably some other oil, less offensive in odor than cod liver, might have been used by the physician with equal advantage.

297.

The organic matter in the infusion changes the iodine so that it no longer gives a test with starch. The benefit derived from the iodine is questionable.

298.

In making ointments the medicinal ingredients must be in the form of a fine powder, soft solid, or solution. Iodine is powdered with difficulty. It might be dissolved in alcohol and this solution added to the lard. The U. S. Pharmacopœia directs that it be dissolved in a glycerin solution of potassium iodide, using equal amounts of potassium iodide and iodine and three times as much glycerin as iodide.

299.

One gram of iodine is soluble in 12.5 Cc. of alcohol or 80 Cc. of glycerin; nearly insoluble in water. The first two ingredients mix, making a clear solution, and water does not precipitate iodine because the present tincture contains potassium iodide.

300.

The U. S. P. says that oil of turpentine is soluble in five volumes of alcohol. In that case this prescription will separate into two layers. The writer has filled this prescription several times and has sometimes had it separate into two layers and sometimes not. On testing oil of turpentine he has found that some samples mix clear with an equal volume of alcohol and some will not. No explanation is offered.

301.

Iodine makes a compound with cocaine hydrochloride which is insoluble in water or glycerin, although glycerin holds it in suspension. It is doubtful if this compound has much anæsthetic effect and the suggestion should be made that separate solutions would be more effective.

302.

On mixing these two ingredients a white precipitate of calcium carbonate is formed, the spirit containing ammonium carbonate. The lime water also throws out of solution the oils of the aromatic spirit. Ordinarily the precipitate would not be

filtered out but the mixture dispensed with a "Shake well" label.

303.

The order of mixing these ingredients makes a difference in the products first formed, but after standing the results are probably similar. If the solution of zinc chloride and the lime water are mixed a white precipitate of zinc hydroxide is formed, and there is no change in appearance on adding the mercuric chloride dissolved in the water.

If, however, the mercuric chloride solution is added to the lime water the yellow oxide of mercury (yellow wash) is precipitated. On adding the zinc chloride solution and allowing it to stand the precipitate is changed within two hours from a dense yellow to a flocculent white precipitate.

If the lime water is added to the solution of mercuric chloride a red brown precipitate of oxychloride of mercury is formed, and this is replaced by a white precipitate when the zinc chloride is added.

That the lime water precipitates nearly all of the mercuric chloride when these two chemicals are brought together in the above proportions is evidenced by taking some of the clear supernatant liquid and passing hydrogen sulphide gas through it and getting little or no black precipitate of mercuric sulphide. If some of the clear solution is taken after the zinc chloride has been added and the yellow precipitate turned white, and this solution is treated with hydrogen sulphide, a heavy black precipitate of mercuric sulphide is produced, showing that the mercuric oxide has been dissolved and the zinc precipitated. Owing to the fact that the mercury is in solution, this prescription might be dangerous if applied in large amounts to an abraded surface, since if all of the mercury is redissolved it will be in the proportion of about 1 to 500.

304.

Sometimes the lime liniment causes a darkening when mixed with citrine ointment. In making the citrine ointment, if the

nitric acid be insufficient in amount, the oxidation of the fatty matter is effected in part at the expense of the mercuric nitrate, forming a mercurous nitrate. Or, the mercury may not be entirely converted into the mercuric nitrate. The calcium hydroxide in the lime liniment acts on the mercurous salt, forming the black mercurous oxide. A translation of the directions is: "Make an ointment, to be used as directed."

305.

Emulsify the cod liver oil by adding it in portions to the lime water in a bottle. Then add the oil of wintergreen, the syrup, and the syrup iodide of iron. The calcium hydroxide of the lime water saponifies a small amount of the cod liver oil, which soap helps to emulsify the balance of the oil. When the syrup of ferrous iodide is added to the mixture containing the calcium hydroxide ferrous hydroxide is precipitated. Ferrous hydroxide if free from ferric hydroxide is white, but it quickly oxidizes to ferroso-ferric hydroxide, which varies from a dirty green to almost black. After some time it is oxidized to a yellow brown basic ferric oxide. This prescription will go through these various colors.

306.

Dissolving zinc sulphocarbolate in dilute solution of lead subacetate gives a white precipitate. A nearly clear solution can be obtained by dissolving the salt in an ounce of water, adding two drams of glycerin and then adding a mixture of the balance of the water and solution of lead subacetate corresponding with the amount of dilute solution which the prescription calls for.

307.

A sticky mass of lead oleate is formed which adheres to the bottle and cannot be shaken up. There seems to be no way to overcome the difficulty and the prescriber should be asked to change the prescription.

308.

Mixing these two liquids gives a sticky mass that is unmanageable. Using the normal lead acetate gives no trouble. In filling this prescription, the compounder (Dimmitt, Nat. Drug., v. 44, p. 118) added twenty drops of acetic acid (36 per cent) to the phenol and heated to the boiling point. The lead solution was put into a twelve ounce bottle and heated on the water bath, then the acid phenol added and the whole heated under pressure until the precipitate formed redissolved. The acid added was not enough to make the normal salt but made a less basic one.

309.

Most of the medicinal matter will be thrown out of solution. The possible reactions are as follows: Tannin gives the insoluble compounds of mercuric tannate, morphine tannate, and lead tannate; mercuric chloride with lead subacetate gives the sparingly soluble lead chloride; morphine sulphate with solution of lead subacetate gives the insoluble free alkaloid and also lead sulphate. Glycerin will keep the precipitates suspended.

310.

On adding olive oil to solution of lead subacetate a very thick liquid results, making a good emulsion. The addition of phenol dissolved in glycerin causes no apparent change. If the glycerin solution of phenol is added to the solution of lead subacetate, white masses are formed and stick to the bottle. Adding the oil and shaking vigorously breaks up the masses somewhat but does not give as good a mixture as when filled by the first method.

311.

If the lime water is added to the solution of lead subacetate the lead is partially precipitated as lead hydroxide, the amount increasing on standing. By adding the glycerin to the lead solution first the lime water causes no precipitation. The zinc oxide is insoluble and quickly settles to the bottom.

312.

This is a very common combination. Lead subacetate forms compounds with nearly all alkaloids, and these are insoluble in water. The opium alkaloids are no exceptions. The alcohol undoubtedly tends to prevent the precipitation to some extent, though there is still quite a heavy one. The lead is also precipitated by the meconic and sulphuric acids in the opium. The precipitate should not be filtered out but the mixture should be dispensed with a " Shake well " label.

313.

Sodium phosphate precipitates a solution of lithium bromide as lithium phosphate. There is more sodium phosphate than the water will dissolve. Heat should not be used to aid the solution, since on cooling large crystals will form. The phosphate should be powdered and the cold water allowed to dissolve what it will. Even then the part left undissolved may form a crystalline mass that can be gotten out of the bottle only by heating.

314.

This makes a mixture which is very thick at first, but yet can be poured. Allow it to stand for half an hour and it solidifies; by the end of twelve hours it is so firm that it cannot be shaken in the bottle. Even if only one half of the amount of magnesia is used the mixture will solidify so that it cannot be shaken up if allowed to stand undisturbed for a day or two. By vigorous shaking several times the mass can be broken up so that it can be poured. Magnesium oxide takes up water to form the gelatinous magnesium hydroxide. The alkalies all tend to prevent the precipitation of the resinous matter in the tincture by the water.

315.

Magnesium sulphate was dissolved in water and the other ingredients added, making a nearly clear solution. Crystallization of magnesium sulphate soon began and ultimately the bottle was over half full of crystals. The alcohol of the spirit and

tincture caused the separation. The prescription was dispensed by making up to eight ounces with water and doubling the dose. This additional water dissolves the crystals.

316.

The first three ingredients were mixed and the Epsom salt dissolved in the water and the two solutions mixed. A turbidity occurred at once, due to the precipitation of extractive matter from the alcoholic liquids by the water. Within a few hours the magnesium sulphate had crystallized out so that its bulk was nearly one half of that of the mixture. Magnesium sulphate, being insoluble in alcohol, is thrown out of its aqueous solution by the alcohol of the fluidextracts and the tincture. This cannot be prevented except by diminishing the magnesium sulphate or increasing the proportion of water. If the mixture is made up to one pint with water the magnesium salt is not thrown out of solution.

317.

In this mixture the menthol floats on top and the boric acid goes to the bottom. Using alcohol, glycerin, or a fixed oil instead of water will not make a clear solution. The attention of the physician should be called to this prescription.

318.

Thymol and menthol liquefy when triturated together. If a powder were used to mass the liquid the required capsule would be entirely too large to swallow. By putting in the menthol, then the guaiacol carbonate, then the thymol, and lastly the eucalyptol, a kind of mass will be formed, but it will be necessary to seal the capsules.

319.

If the menthol is dissolved in the spirit and then the water added the mixture becomes turbid, and on standing an oily liquid comes to the top, the menthol separating in that form instead of in crystals. This is probably not due to any effect of the ethyl nitrite or the acids usually present in the spirit, as a similar result

is produced when alcohol is used in place of the spirit. The alcohol in the prescription clears it up but the solution turns red on account of the spirit of nitrous ether oxidizing resorcin.

320.

If the sulphate of iron is strictly ferrous, no liberation of iodine takes place when a solution of potassium iodide is added to it, but most of it contains some ferric salt which liberates iodine. If the morphine is now added it will be precipitated by the iodine. The solution of ferrous sulphate gradually deposits a precipitate of subsulphate of iron. Or if the solution of ferrous sulphate and the morphine are mixed before adding the potassium iodide no free iodine is formed, the morphine seeming to reduce the ferric sulphate to ferrous.

321.

This mixture in a short time becomes yellow and within twenty-four hours it changes to a light brown. The coloration is due largely to the action of the nitrous acid on the morphine. Less change takes place if the mixture is neutral. The morphine is converted into nitroso-morphine, pseudo-morphine, and another base (M. & M., III. 436).

322.

The dose of the morphine sulphate is considerably in excess of the amount usually given. The prescriber shows his knowledge and appreciation of this fact by putting three exclamation-points after the ingredient. The prescription should be filled as written. Some physicians when wishing to give unusual doses underscore the ingredient and the quantity. The latter is perhaps a better method, as there is less danger of a mistake. The directions are: Mix. Dispense in 10 capsules. Label: Let one be taken during the night.

323.

The potassium chlorate is soluble in about 11.5 parts of water; consequently only a small proportion is dissolved in the

three ounces of water. Some pharmacists would contend that the excess of the chlorate in a powdered condition should be left in the bottle, so that the patient could add water to it as the liquid was used up. This might be all right if it were a simple mixture of the chlorate and water. But in the above prescription, since the fluids are all more or less medicinal, it is evident that the physician wanted only a saturated solution of the chlorate and the excess removed. The resinous matter of the tincture is precipitated by the water. The fluid hydrastis colorless is a preparation which seems to vary much in composition. The U. S. Dispensatory gives a method of making it which consists in dissolving twenty grains of hydrastine sulphate in one pint of a mixture of equal parts of glycerin and water.

324.

The glycerin was added to the tincture of myrrh, then the solution of potassium chlorate in small amounts with continued shaking, and the tincture of iron last. Tincture of iron gives a dark green-brown color with tincture of myrrh. Water precipitates the resinous matter from the tincture of myrrh, and it forms in masses that cannot be evenly suspended. It seems to make but little difference whether the alcoholic mixture is added to the aqueous or the aqueous to the alcoholic. By using honey instead of glycerin the resin is separated but does not form masses, consequently it can be evenly distributed through the liquid.

325.

Castor oil and nearly all other fixed oils do not make clear solutions with glycerin. A "Shake well" label is necessary for this prescription. The oil need not be emulsified, as the two liquids are thick and do not separate quickly.

326.

Shaking the solution of potassium hydroxide with the olive oil gives a white emulsion; some soap is formed in the reaction and this acts as an emulsifying agent. The compound iodine solution added to this gives a red brown mixture, which

slowly loses its color, becoming white within a few hours. The iodine is partly changed by the alkali, forming an iodide and an iodate. Part of the iodine combines with the oil to form a nearly colorless compound in which two atoms of the iodine are combined with one molecule of olive oil.

327.

If the turpentine is poured upon the iodine violent chemical reaction results, with the formation of violet fumes of vaporized iodine, caused by the heat generated. While there is not enough of alcohol to dissolve all of the iodine, it is best to dissolve as much as possible before adding the turpentine, which should be added in small portions, cooling the mixture if necessary. Upon standing the liquid separates into two layers, the lower one, being much smaller in amount, is the alcohol. Turpentine and alcohol are not miscible in all proportions.

328.

Filled as directed this prescription gives a nearly colorless mixture which does not give a test for free iodine. On standing two layers are formed, the upper being about one third of the volume of the lower. The upper layer consists chiefly of turpentine, while the lower consists of the alcohol containing some oil of turpentine and an iodide of mercury. Leaving out either the turpentine or mercuric chloride, the iodine is not all reduced. If the mercuric chloride is left out the lower layer is smaller in volume and is nearly colorless, while the upper one is chiefly alcohol containing free iodine. The turpentine is the principal factor in reducing the iodine. The mercuric chloride perhaps acts as a carrier or acts by breaking up the compound which iodine forms with the oil, thereby allowing the oil to combine with more iodine.

329.

If these ingredients are mixed together and allowed to stand the oil of turpentine will rise to the top. The oil should first be emulsified with the syrup and about forty-five grains of acacia and then the other liquids added. When water is added to

paregoric the oil of anise and the benzoic acid are precipitated, but these would be held in suspension by the emulsion. Sometimes the solution of ammonium acetate is alkaline, there having been an excess of ammonium carbonate or a deficient amount of acetic acid used in making it. In such a case the acid in the syrup of squills will liberate carbon dioxide.

330.

Rubbing chloral hydrate with oil of theobroma causes the oil to soften so much that it is difficult to make suppositories unless a large amount of oil is used. After making a thorough mixture of the ingredients, if the mass is allowed to stand a while it will harden so that it can be worked. A little spermaceti might be melted and mixed in, care being taken not to raise the melting point above the temperature of the body.

331.

Sodium bromide on being exposed to the air attracts moisture. Pepsin is somewhat hygroscopic if contaminated with peptones. Pepsin is rendered inert by alkalies, as sodium bicarbonate.

332.

The ingredients of this prescription can be mixed so as to make a homogeneous mass, but on standing for a few days the balsam separates from the petrolatum. This can be prevented by incorporating one and a half drams of simple cerate or of lanolin in place of a like amount of petrolatum. The odor of iodoform is gradually lost, due, according to the U. S. D., to the formation of a new compound. Rubbing the balsam with lard for a few minutes the mass gets granular and then the resinous matter seems to stick together and the lard is worked out. A little castor oil is said to be good in preventing separation.

333.

By triturating the zinc oxide and carbonate with the petrolatum, and then adding the lime water gradually, a partial emulsion

can be effected. By the addition of thirty grains of acacia an emulsion can be made, which soon separates into three layers, the bottom consisting of the zinc salts, the middle chiefly of water, and the top of the emulsified petrolatum. These are readily mixed on agitation. Petrolatum is not saponified or otherwise chemically acted upon by calcium hydroxide or other hydroxides, as are the organic fixed oils and fatty substances. The best way to fill this prescription is to replace about one half of the petrolatum with anhydrous wool fat, mix the water with this, then the oxide and carbonate, and lastly the petrolatum.

334.

The vaselin will not dissolve in the bay rum and on being melted and shaken with the bay rum until cold separates in a mass. Acacia cannot be used to emulsify it on account of the alcohol present. The addition of soap or resinous matter in admissible amounts does not help it. If lanolin is used instead of petrolatum the acid can be mixed with it and about one half of the alcohol, making a homogeneous mass, but the balance of the alcohol separates. The amount of carbolic acid is very large, the mixture being so strong as to quickly make the skin white. The prescriber should be consulted.

335.

Menthol, chloroform, and liquid petrolatum make a clear mixture, but on shaking the mixture with the tincture it is made turbid and on standing separates into two layers. The upper one is nearly clear and colorless and the lower one is red and of small volume. Alcohol and the petrolatum oil do not remain mixed.

336.

This prescription was sent in by a druggist, asking if it should separate into two layers. It should, as the hydroxide does not saponify the mineral oil. If a vegetable or animal oil were used, enough of soap would be formed to keep the oil and water mixed for a time.

337.

Piperazine is strongly alkaline and when added to an aqueous solution of phenocoll hydrochloride precipitates the insoluble base phenocoll. Under certain circumstances, as when the phenocoll hydrochloride is from fifty to one hundred per cent in excess of the piperazine, a clear solution is said to be obtained. This prescription was filled by dissolving the phenocoll hydrochloride in the elixir, syrup, and peppermint water, and the piperazine in the water. The two solutions were mixed, making a clear solution, which remained clear for two days. It then happened to be chilled at night and crystallization took place, making an almost solid mass, which remained so even at the ordinary temperature. On warming a solution resulted, which remained clear at the ordinary temperature, but again solidified on being chilled.

338.

Water can be added to carbolic acid, forming a clear solution. On adding more water the acid separates as an oily liquid, going to the bottom. When water has been added so that the proportion is about 1 part of acid to 15 parts of water, a clear solution again results. In this prescription there will be a layer of liquefied acid in the bottom of the bottle. If the brush should remain in the bottle between the periods of using it, there is danger that it will become saturated with the strong acid and that the patient will apply it in this condition. By the use of two drams of glycerin in place of part of the water a clear solution can be made, and this is what the dispenser should use.

339.

Crystallized carbolic acid when triturated with lead acetate or with thymol gives a liquid, and the reaction cannot be prevented by first mixing the ingredients with separate portions of the base and then rubbing these together. Either phenol or thymol soften the oil when rubbed with it. The mass is too soft to make into suppositories, and it is necessary to use some drying-powder or spermaceti to stiffen it. The directions are: Mix. carefully. Make 10 suppositories.

340.

The euphorin, aristol, tannic acid, and alum can be triturated together, producing a powder. On adding the crystallized carbolic acid to this mixture, it becomes very soft, almost liquid. This change is the result of bringing carbolic acid in contact with the euphorin, these two substances liquefying when triturated together. The mass with the oil of theobroma makes a mixture too soft to be made into suppositories. Carbolic acid alone has a softening effect on the oil. In summer it is necessary to render it firmer by the addition of wax, spermaceti, or some absorbing powder, as starch or slippery elm or by standing.

341.

The dispenser in commenting on this prescription said that phenol and the cocaine solution gave a precipitate which was dissolved by the glycerin. The trouble between the solution and the phenol is not on account of the cocaine but the water. Water and phenol in equal proportions make a turbid mixture which separates into two layers. Glycerin is a good solvent for phenol and water does not cause its separation. This prescription makes a clear solution.

342.

Salol dissolves in the mixture of oils. A mass can be made with a drying powder but it is preferable to use no drying powder. The capsules must be sealed. This can be done by swabbing the inside of the cap with a damp wad of absorbent cotton on a match. Or, the caps when taken off can be placed on end on a filter paper wet with a mixture of equal volumes of water and alcohol. After the cap is put on the capsule should be left standing on end until dry. Care should be used not to wet the cap too much or the capsule will be distorted.

343.

Exalgin triturated with camphor makes a damp powder, or with salol it gives a liquid. Salol and camphor triturated together give a liquid. This mixture cannot be dispensed in the form of powders unless a large amount of some absorbing

powder, as slippery elm, is used. Or, the prescription can be filled by using some drying powder and putting the mass into capsules.

344.

Salol and thymol triturated together make a liquid. When the other ingredients are added the mass is still much too soft to be made into pills. If a sufficient amount of liquorice root is added to make the mass of the required consistency the pills are too large to be taken easily and if dispensed as pills the number and the dose should be doubled. This prescription can best be dispensed in capsules. The oily liquid does not dissolve gelatin, the mass can be much softer and smaller than if pills are made, and generally a larger capsule can be taken than a pill.

345.

Salol rubbed with antipyrine makes a mass. Aspirin rubbed with either salol or antipyrine does not become sticky. This prescription can be filled without trouble by powdering the salol alone and the other ingredients together then mixing the salol and a little drying powder (starch because it is white) with a spatula on a pill tile.

346.

In filling this prescription the phosphorus should be dissolved in a little absolute alcohol or chloroform and then mixed with a part of the elixir, as it can not be dissolved in the elixir. The soluble phosphate of iron should be dissolved in a little hot water and the strychnine in this solution and then added to the elixir containing the phosphorus and a sufficient amount of the elixir to make two fluid ounces. No allowance need be made for volume taken up by the solids.

347.

In the presence of moisture this mixture becomes black. The pilocarpine hydrochloride breaks up the calomel, forming mercuric chloride which combines with the alkaloidal salt, and metallic mercury which gives the mixture its dark color. Several of the alkaloids have that property. The directions translated

into English are: Mix. Send 8 such powders. Label: Take one powder night and morning.

348.

The pilocarpine differs from many alkaloids in that it is soluble in water. The hydrochloride is used much more frequently than the free alkaloid. The terpin hydrate requires about 200 parts of water for solution; consequently only a small portion of it will be dissolved. A " Shake " label is necessary. A more elegant preparation would be made by emulsifying it.

349.

Piperazine is so deliquescent that it becomes liquefied when exposed to air; consequently it cannot well be dispensed in the form of powders unless a large amount of absorbent is used. It also takes up carbon dioxide from the air. It should be dispensed in solution. The directions are: Let it be triturated well. Let 12 powders be made.

350.

Although a clear solution is produced at first, within a few minutes a crystalline precipitate begins to form. Piperazine is quite strongly alkaline and causes a precipitation of the strychnine. As written this should be considered a dangerous combination. The difficulty can be remedied by neutralizing the piperazine solution with dilute sulphuric acid.

351.

The quinine sulphate and the lead acetate react, forming quinine acetate and lead sulphate, both of which are practically insoluble in the syrup. The bismuth subnitrate is also insoluble. The syrup holds the insoluble substances in suspension for a time. A little acacia or tragacanth might be used if desired. A " Shake well " label should be put on the bottle.

352.

Triturating the alum with the lead acetate produces a moist sticky mass. This is due to the chemical reaction which takes

place, forming lead sulphate, aluminum sulphate, potassium acetate, and liberating the water of crystallization which makes the mixture sticky. A mass is obtained when zinc sulphate and lead acetate are rubbed together. In either case the odor of acetic acid is noticeable. When the mixture is put into water the tannic acid will precipitate the lead, if any remains not combined with sulphuric acid, as lead tannate. The other two salts are not so readily precipitated as tannates. In filling this prescription the water of crystallization may be removed by heating, or the ingredients may be powdered separately and then mixed lightly, and no difficulty will ensue.

353.

This gives a white precipitate of lead citrate due to the action of the citric acid in the syrup of lemon acting on lead acetate. If simple syrup flavored with lemon is used no precipitate results.

354.

This mixture is permanent in a dry atmosphere, but in a damp one it absorbs moisture. Either in the presence of absorbed moisture or when taken into the stomach several reactions are liable to take place. Lead sulphate would be formed from the lead subacetate and morphine sulphate. The sodium bicarbonate would react with each of the other three ingredients, forming with bismuth subnitrate, bismuth subcarbonate and carbon dioxide; with lead subacetate, lead carbonate; with morphine sulphate, the free alkaloid. Lead subacetate would also combine with the morphine to make a compound insoluble in water. These incompatibilities do not make a dangerous mixture, and there is no reason for declining to fill it.

355.

Potassium permanganate oxidizes salicylic acid to formic acid and carbon dioxide and oxidizes the ferrous sulphate to ferric sulphate, while manganese dioxide is precipitated. There not being enough of acid to combine with all of the ferric iron, part of it is precipitated as a red brown basic ferric salt, which

with the black manganese dioxide makes a dark brown mixture. When the solid matter settles there is left a violet colored supernatant liquid. The violet color is due to the formation of ferric salicylate. There is not enough of permanganate to oxidize all of the salicylic acid or all of the ferrous sulphate.

356.

This prescription has come to the writer from several different sources. The object of the prescriber is not plain. Oxalic acid reduces the ferric iron and the permanganate. The permanganate quickly changes the oxalic acid to carbon dioxide. The best method to use in making pills is to powder each ingredient separately and mix each with a little wool fat so that the particles will not come in contact with one another, using kaolin as a drying and dusting powder. Petrolatum may be used but the mass is not quite as adhesive.

357.

The potassium permanganate was dissolved in part of the water and the glycerin was diluted with the balance of the water; the two solutions were then mixed. Within two minutes the mixture was of a brownish black color and almost solidified by the manganese dioxide that was formed. After standing the precipitated manganese dioxide settled, leaving a clear colorless solution, showing that the permanganate was all reduced. When potassium permanganate and concentrated glycerin are brought together there is some liability of the mixture exploding or inflaming. The oxidation products of the glycerin are probably formic, propionic, and tartronic acids; in an alkaline mixture oxalic and carbonic acids are formed.

358.

Potassium permanganate oxidizes carbolic acid to oxalic acid and carbon dioxide. (Morley and Muir, III. 832.) The permanganate is reduced and precipitated as manganese dioxide, which makes the mixture a semi-solid, but by shaking it may be

gotten into a condition so that it can be poured. There is a large excess of carbolic acid not oxidized.

359.

The pharmacist should not use the excipient directed. Potassium permanganate is easily reduced by organic matter, which it in turn oxidizes. Some excipient must be chosen that will not reduce the permanganate. A mixture of equal parts of petrolatum, paraffin, and kaolin makes a good one, or wool fat with kaolin may be used. When filled as written no permanganate could be detected at the end of a week.

360.

Potassium permanganate oxidizes quinine sulphate to pyridin tricarboxylic acid, oxalic acid, and ammonia (M. & M., IV. 375). It also oxidizes the iron. When the permanganate and the iron are rubbed together a detonation takes place. The excipient should be one that will not reduce the permanganate, and it should also protect the other ingredients; a mixture of equal parts of paraffin, petrolatum, and kaolin is a good one, or resin cerate with kaolin may be used.

361.

This prescription was filled by dissolving the quinine sulphate in the acid and mixing with the mucilage, and then adding the oil of cloves. The potassium permanganate was dissolved in a little water and added slowly to the other mixture. Dark brown masses were formed, consisting of coagulated acacia holding in it the manganese dioxide, the permanganate being reduced. It was almost impossible to mix these masses so as to make a homogeneous mixture or even one that would pour readily. On standing a few hours the manganese dioxide is further reduced to manganous sulphate and the mixture becomes colorless. The patient using this prescription had it refilled several times.

362.

On adding the zinc sulphate to the protargol solution a voluminous light brown precipitate forms and settles. The addition of about eighty minims of ammonia water clears it, and the morphine gives only a slight precipitate with it; on standing a dark green precipitate forms in a few hours and remains suspended. The prescription should be filled as written.

363.

On mixing solution of protargol and cocaine hydrochloride a precipitate is produced in a few hours and precipitation goes on slowly for several days. Saturating the water with boric acid seems to retard the precipitation. The precipitate in suspension has a grayish color, but when settled it is of a bluish purple. The liquid has a blue fluorescence like quinine sulphate.

364.

An absorbent powder will be necessary to make a mass that can be put into capsules. When pyrocatechin is rubbed with acetanilid or phenacetin a liquid results. Acetanilid and phenacetin do not liquefy.

365.

On adding a solution of pyrogallol to a solution of lead acetate a white precipitate is formed, which turns dark in a few days, the upper portion getting black much sooner than the lower. The lead in this prescription is not all precipitated.

366.

This ointment, which is nearly white at first, soon becomes darkened and ultimately nearly black. The pyrogallic acid is oxidized and turned black by contact with air and light. It is also oxidized by the mercuric chloride, which is reduced to metallic mercury, while the pyrogallic acid is changed to acetic and oxalic acids (Richter).

367.

This makes a clear solution at first but in a day or two a gelatinous precipitate begins to form and ultimately gives a gelatinous mass, white, getting a little yellow if allowed to stand for two or three weeks. Fowler's solution, being alkaline, neutralizes a part of the free acid and quinine is precipitated, perhaps as the sulphate or as the sulphate in combination with hydriodic acid. Ordinarily the prescription will be used up before there is enough gelatinization to trouble.

368.

There is enough of ammonium carbonate present to neutralize all of the sulphuric acid and liberate the free alkaloid. The quinine sulphate should be dissolved in part of the syrup with the aid of the acid, and the carbonate in the remainder of the syrup. These two solutions should be cooled thoroughly before mixing, because when warm the free alkaloid collects in sticky masses and it is impossible to get it evenly divided. The effervescence is due to the liberation of carbon dioxide by the acid and comes off slowly. If the prescription must be dispensed quickly the carbonate should be added directly to the acid.

369.

This can be filled by dissolving the alkaloidal salts in the syrup of lemon and tincture of iron, adding the water, and then the phosphoric acid last. The solution is clear and of a pale reddish color previous to the addition of the acid. After the addition of the acid the solution becomes colorless and slightly turbid and in a few minutes a heavy precipitate is formed. The three disturbing causes are tincture of iron, phosphoric acid, and quinine sulphate, leaving out any one of which prevents precipitation. If the amount of quinine is reduced to three grams there is but little precipitation and none if it is reduced to two grams. The decoloration is due to the formation of ferric phosphate, which is insoluble in water but soluble when there is an excess of free acid. By using

enough of dilute sulphuric acid to dissolve the quinine in water no precipitation results.

370.

Basham's mixture contains acetic acid and an acetate. The quinine salt dissolves in this, but within a few minutes it is thrown down as a bulky crystalline quinine acetate. The mixture is so thick that it would be difficult to pour out an even dose.

371.

This prescription makes at first a clear solution, which gives a precipitate on standing a short time. If the tincture of iron is not strongly acid the precipitate is yellowish brown. The precipitate was filtered out and washed with water until the washings no longer gave a test for iron. It was then dissolved in dilute sulphuric acid; the solution was not fluorescent or bitter; on adding ammonia water it gave a heavy red brown precipitate of ferric hydroxide. From this it was supposed that the original precipitate was a basic salt of iron which had been thrown out of solution by the quinine taking some of the hydrochloric acid from the tincture to form a more soluble quinine salt.

If, however, some hydrochloric acid is added to the tincture before adding the alkaloidal salts, or the tincture is quite strongly acid, or quinine bisulphate is used, the solution deposits prismatic crystals. These crystals dissolve readily on addition of water, and are a quinine salt separated out from a supersaturated solution. The pharmacist in dispensing the prescription should see that the tincture is quite strongly acid. The physician should also give his consent to allow the solution to be diluted with water with an increase in the dose.

372.

The tannic acid combines with the quinine, forming the nearly insoluble quinine tannate. This prescription should be filled by dissolving the quinine sulphate in a part of the syrup with the aid of the sulphuric acid. The tannic acid should

be dissolved in the remainder of the syrup and this gradually added to the other solution with constant stirring. Both solutions should be cold, because if mixed when warm the precipitate formed is sticky and will make a mass that cannot be evenly divided.

373.

The quinine sulphate would not be entirely soluble even though there were no tannic acid in the infusion. The tannic acid converts the quinine sulphate into the less soluble quinine tannate. The oil in the spirit of rosemary is thrown out of solution, as well as some of the inert matter in the tincture. This is a poor combination, even for an external preparation.

374.

The difficulty with this prescription is that the pills would be entirely too large. By using the more dense quinine bisulphate and putting the mixture into capsules, it can be dispensed.

375.

The citrate of iron and quinine was dissolved in a part of the wine, making a clear acid solution. To this was added the carbolic acid dissolved in the balance of the wine. A light yellow sticky precipitate was formed. The composition of the precipitate was not determined, but on testing it quinine was proved to be present. Moreover, when iron citrate is used instead of the iron and quinine citrate no precipitation occurs. The precipitate is not dissolved by the further addition of the tincture, neither is precipitation prevented by adding a little dilute sulphuric acid. The tincture darkens the mixture a little and slightly increases the turbidity.

376.

The resin from the fluidextract is precipitated, making masses and sticking to the bottle so that it cannot be shaken loose. By adding a half ounce of honey to the fluidextract first the precipitate formed can be readily mixed. The syrup of tolu should then be diminished a half ounce.

377.

On dissolving the quinine bisulphate in glycerin, alcohol, and part of the water and the resorcin in the balance of the water, a clear solution is obtained. In a few minutes small needle-shaped crystals are formed and crystallization continues for some time. The resorcin destroys the fluorescence and precipitates the quinine.

378.

Resorcin does not dissolve in liquid petrolatum but it is easily soluble in water, alcohol, or ether. It has been suggested that it be dissolved in alcohol before mixing with the petrolatum, but alcohol does not make a clear solution with liquid petrolatum and separates. Solutions of resorcin in alcohol and in ether were added to the petrolatum and heat applied to volatilize the solvent, but resorcin was precipitated. Probably the best that can be done is to dissolve the resorcin in a few minims of water and add to the liquid petrolatum, sending the prescription out with a shake well label, although this is not a good preparation for a spray. It would be well to communicate with the prescriber.

379.

The maximum dose of santonin, as given by most authorities, is four grains, some giving as high as five grains. Having two maximum doses coming so close together renders this prescription a dangerous one. Prescriptions containing santonin should be protected from the light, as light causes a change in color from white to yellow, probably with the formation of new compounds. Inquiry should be made to determine whether it is for a child or an adult and if for the former the prescription should not be filled, as two grains are said to have killed a child.

380.

One gram of santonin is soluble in about 43 Cc. of alcohol, nearly insoluble in water, and not readily soluble in turpentine. The amount prescribed is not all soluble in the mixture. The turpentine does not mix, but floats on top. Extractive matter from the fluidextracts is precipitated. The santonin should be

in the form of a fine powder and the mixture made into an emulsion.

381.

The soap acts as an emulsifying and solidifying agent and the consistency of this mixture is about that of lard. Soap is nearly always alkaline and acts on the calomel, producing the black mercurous oxide. This explains why the mixture slowly turns dark.

382.

While this makes a fair powder at first, it becomes sticky on standing. Quinine sulphate and boric acid seem not to react on each other but either one with soap liberates some oleic acid which causes the mixture to become sticky. If dispensed in a pasteboard box, the box becomes greasy.

383.

Several chemical reactions will take place, depending upon the order of mixing. The possible reactions are as follows: 1. Ferric iron is reduced to ferrous iron, giving at first a red solution of ferric thiosulphate. 2. The hydrochloric acid of the tincture reacts with the thiosulphate, forming sodium chloride, sulphurous acid, and sulphur. 3. With potassium chlorate, the sulphurous acid thus formed gives potassium sulphate, hydrochloric and sulphuric acids. 4. Hydrochloric acid with potassium chlorate gives potassium chloride, water, chlorine, and several oxides of chlorine. 5. The chlorine thus formed oxidizes the reduced ferric salt back to the ferric condition and oxidizes the hyposulphite to a sulphate.

There is not enough water to dissolve all of the chlorate, and after the reactions have taken place there is not enough acid to form a normal ferric salt of all of the iron; a part of it remains as an insoluble oxychloride.

384.

This combination is an unusual one but one which the writer has seen twice. The thiosulphate reduces calomel to metallic

mercury, the mixture being darkened at once. In triturating the mixture, it becomes almost liquid from the water of crystallization liberated.

385.

A thick gelatinous mass of strontium citrate is formed. The mass is so thick that it is difficult to pour.

386.

Giving but a glance at this prescription we would conclude that it should not be dispensed, that the strychnine would be precipitated. But upon closer study we find that the solution of strychnine, B. P., is an acid hydro-alcoholic solution containing about one per cent of strychnine hydrochloride. On adding sodium bicarbonate to this the hydrochloric acid combines with it, and the strychnine is liberated, but not precipitated. Strychnine (free alkaloid) is soluble in about 6420 parts of water. In this prescription we have only about 0.015 Gm. in 100 Cc., or 1 part to 7500 of water, a sufficient amount of water to keep the alkaloid in solution.

387.

A clear solution is formed at first, but in about a half hour needle-shaped crystals begin to fall. The precipitate increases for several hours and contains strychnine which is thrown out of solution with the iodide. Much commercial potassium iodide contains a carbonate, but in this case an iodide free from carbonate was used. It has been suggested to use acacia to suspend the precipitate, but it is objectionable if not dangerous to send out a shake mixture in which strychnine is precipitated.

388.

When this prescription is filled as written a crystalline precipitate forms at once. Both Fowler's solution and potassium iodide precipitate the strychnine. Neutralizing Fowler's solution will prevent its causing trouble, but there will still be danger from the potassium iodide precipitating the strychnine.

389.

There is a sufficient amount of alcohol and water to prevent the gold salt from precipitating strychnine. However, the gold is reduced to the metallic condition in a few hours, largely by the alcohol but partly by the syrup. The gold as precipitated has a purplish color by transmitted light but yellow or brown by reflected light.

390.

The strychnine will not dissolve in the glycerin or in the water. Strychnine sulphate or nitrate (the nitrate is the more common for hypodermic injection) should be used. In the absence of the prescriber the nitrate should be dispensed, later notifying him of the change.

391.

Trional and salol produce a soft mass when rubbed together, and a drying powder is necessary.

392.

When lime and sulphur are boiled together a red solution is formed. The calcium and sulphur unite to form calcium thiosulphate and calcium disulphide or pentasulphide, depending on the proportions. This is the first reaction in making the official precipitated sulphur.

393.

Terpin hydrate is not entirely soluble in elixir and separates quickly. It should be rubbed with about thirty grains of powdered acacia first, then a little water, and the elixir containing the other ingredients.

394.

Diuretin is sodium-theobromine salicylate and is readily soluble in water; acids decompose it. Theobromine differs from many alkaloids in that it does not readily combine with acids.

In this prescription the diuretin was dissolved in the syrup and then the spirit of nitrous ether added and lastly the tincture of iron. When the iron is added a very deep violet color is produced due to the formation of ferric salicylate and on allowing the mixture to stand a few hours a white precipitate falls: the acids in the tincture and spirit liberate the theobromine and salicylic acid.

395.

Thymol dissolves in a solution of potassium or sodium hydroxide but not in borax. It floats on top and will not stay mixed long enough to get an even amount. Dissolving it first in a little alcohol does not help. The thymol should be powdered with about fifteen grains of acacia and water added and afterwards the borax dissolved in water.

396.

Salol and thymol rubbed together make a liquid. Mixing the bismuth with the salol and putting into the konseal, then putting in the thymol without mixing will give a mass on standing which does not affect the konseal. Dunning (Bul. Pharmacy, v. 24, p. 290) advises putting the proper amount of thymol into a No. 5 capsule and putting it with the proper amounts of salol and bismuth into a konseal. This procedure may avoid trouble in other cases.

397.

The zinc is entirely precipitated by the borax, producing a white flocculent precipitate of zinc borate or a mixture of the borate with a basic compound. The prescriber should be advised of this fact and the suggestion made that he use boric acid in place of borax. If the prescription is dispensed the precipitate should be filtered out. While glycerin decomposes borax and liberates boric acid, the sodium metaborate formed still gives a precipitate with zinc sulphate but not so great as borax.

398.

The pharmacist in filling this prescription shook the two salts with the water, expecting to get a clear solution, but instead got quite a heavy precipitate. Some samples of zinc iodide do not entirely dissolve in water and when filtered give a precipitate with a solution of zinc chloride. This is due to an alkali being left in to preserve the iodide. Some samples of zinc chloride do not entirely dissolve on account of the formation of some oxychloride resulting from too high fusion.

399.

The potassium sulphide in the " liver of sulphur " precipitates part of the zinc as the white zinc sulphide. There is left in solution some zinc sulphate, potassium sulphate, and potassium thiosulphate.

400.

Menthol is soluble in the petrolatum but zinc sulphate is not. About the only way this can be filled is to dissolve the sulphate in about ten minims of water, mix with the petrolatum and put on a shake well label. It is not a good practice to send out such mixtures for sprays. The prescriber should rewrite this prescription.

A TABLE SHOWING THE EFFECT OF RUBBING TOGETHER EQUAL WEIGHTS OF TWO SOLIDS

	Acetamid.	Acetanilid.	Antipyrine.	Bromal hydrate.	Butyl chloral hydrate.	Camphor.	Camphor, borneol.	Camphor, monobromated.	Carbolic acid.	Chloral alcoholate.	Chloral hydrate.	Diuretin.	Euphorin.	Exalgin.	Lead acetate.	Menthol.	Methacetin.	Naphthalene.	Naphthol, beta.	Phenacetin.	Pyrocatechin.	Pyrogallol.	Resin.	Resorcin.	Salicylic acid.	Salol.	Sodium phosphate.	Sodium salicylate.	Thymol.	Urea.	Urethane.
Acetamid	P	P	L	L	L	P	P	P	L	L	L	P	P	P	L	P	P	P	P	P	L	L	....	L	P	P	L	P	L	P	L
Acetanilid	P	P	P′	P	P	P	P	P	L	L	P′	P	P	P	P	P	P	P	P	P	L	P	P	L	P	P	P	P	L	P	P
Antipyrine	L	P′	P	L	P²	P	P	P	L	L	L	P	L	P	P	P	P	P	L	P	L	L	P	L	P²	P′	P	M	L	P	L
Bromal hydrate	L	P	L	P	P	P	L	P	L	P	P	M	L	L	P	L	M	P	P	P	L	P	....	P	P	P	P	P	P	L	L
Butyl chloral hydrate	L	P	P²	P	P	P²	P	P	L	P	P	P	P	L	P	L	P	P	P	P	L	P	....	P	P	P	P	P	P²	P	L
Camphor	P	P	P	P	P²	P	P	P	L	L	L	P	L	P	P	L	P	P	L	P	L	L	P	L	P	L	P	P	L	P	L
Camphor, borneol	P	P	P	L	P	P	P	P	L	L	L	P	L	P	P	L	P	P	L	P	L	P	....	L	P	L	P	P	L	P	L
Camphor, monobromated	P	P	P	P	P	P	P	P	L	L	L	P	L	P	P	P	P	P	P	P	L	P	P	P	P	L	P	P	L	P	P
Carbolic acid	L	L	L	L	L	L	L	L	P	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	P	L	L	P	L	P	L
Chloral alcoholate	L	L	L	P	P	L	L	L	L	P	P	M	L	L	P	L	L	P	P	P	L	P	....	L	P	L	P	P	L	L	L
Chloral hydrate	L	P′	L	P	P	L	L	L	L	P	P	L	L	L	L	L	L	P	P	L	L	P	P	P	P	L	L	P	L	L	L
Diuretin	P	P	P	M	P	P	P	P	L	M	L	P	P	P	P	P	P	P	P	P	M	M	....	P	P	P	P	P	P	P	P
Euphorin	P	P	L	L	P	L	L	L	L	L	L	P	P	L	P	L	P	P	P	P	L	P	P′	L	P	L	P	P	L	P	L
Exalgin	P	P	P	L	L	P	P	P	L	L	L	P	L	P	P	L	P	P	L	P	L	L	P	L	L	L	P	P	L	P	L
Lead acetate	L	P	P	P	P	P	P	P	L	P	L	P	P	P	P	P	P	P	P	P	M	M	....	M	L	P	L	M	P	L	P′
Menthol	P	P	P	L	L	L	L	P	L	L	L	P	L	L	P	P	P	P	L	P	L	L	L	L	P	P	P	P	L	P	L
Methacetin	P	P	P	M	P	P	P	P	L	L	L	P	P	P	P	P	P	P	P	P	L	P	P	M	P	P	P	P	P	P	P
Naphthalene	P	P	P	P	P	P	P	P	L	P	P	P	P	P	P	P	P	P	P	P	P′	P	P	P	P	L	P	P	P	P	P
Naphthol, beta	P	P	L	P	P	L	L	P	L	P	P	P	P	L	P	L	P	P	P	P	L	P	P	P	P	P	P	P	P	P	L
Phenacetin	P	P	P	P	P	P	P	P	L	P	L	P	P	P	P	P	P	P	P	P	L	P	P	P	P²	P	P	P²	P	P	P
Pyrocatechin	L	L	L	L	L	L	L	L	L	L	L	M	L	L	M	L	L	P′	L	L	P	L	....	P′	P	L	L	P	L	L	L
Pyrogallol	L	P	L	P	P	L	P	P	L	P	P	M	P	L	M	L	P	P	P	P	L	P	P	P	P	P	M	P	P	L	L
Resin	....	P	P	....	....	P	....	P	L	....	P	....	P′	P	....	L	P	P	P	P	....	P	P	P	P	M	P	....	M	....	M
Resorcin	L	L	L	P	P	L	L	P	L	L	P	P	L	L	M	L	M	P	P	P	P′	P	P	P	P	P	P′	P	P	P	L
Salicylic acid	P	P	P²	P	P	P	P	P	P	P	P	P	P	L	L	P	P	P	P	P²	P	P	P	P	P	P	L	P	P	P	L
Salol	P	P	P′	P	P	L	L	L	L	L	L	P	L	L	P	P	P	L	P	P	L	P	M	P	P	P	P	P	L	P	L
Sodium phosphate	L	P	P	P	P	P	P	P	L	P	L	P	P	P	L	P	P	P	P	P	L	M	P	P′	L	P	P	P′	P	P	P
Sodium salicylate	P	P	M	P	P	P	P	P	P	P	P	P	P	P	M	P	P	P	P	P	P	P	....	P	P	P	P′	P	P	P	P
Thymol	L	L	L	P	P²	L	L	L	L	L	L	P	L	L	P	L	P	P	P	P²	L	P	M	P	P	L	P	P	P	P	L
Urea	P	P	P	L	P	P	P	P	P	L	L	P	P	P	L	P	P	P	P	P	L	L	....	P	P	P	P	P	P	P	P
Urethane	L	P	L	L	L	L	L	P	L	L	L	P	L	L	P′	L	P	P	L	P	L	L	M	L	L	L	P	P	L	P	P

L = Soft mass or liquid. M = Stiff mass which dries. P = Dry powder. P′ = Slightly damp powder, quickly drying.
P² = Said to liquefy, but the writer obtained a dry powder.

TABLE OF SOLUBILITIES

The Pharmacopœia and National Formulary now give the number of millileters of the solvent required to dissolve one gram of the solid, instead of parts by weight as heretofore. The U. S. P., IX and the N. F., IV compounds are marked with a star (*), and the solubilities here given are those given by these authorities, provided they give numbers. In other cases the solubilities are given in parts by weight and, being taken from a large number of sources, are often only approximate.

Abbreviations: sol., soluble; v. s., very soluble; a., all proportions; m. s., moderately soluble; sp. s., sparingly soluble; dec., decomposed; ins., insoluble.

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Absinthin	sp. s.	sol.	sp. s.	sol.		
*Acacia	2	ins.	ins.	ins.		
Acetal	20	a.	a.	25		
*Acetanilid	190	3.4	1.7	3.7	5	47 benzol
*Acetone	a.	a.	a.	a.	.....	a. vol. oils
Acetophenone	ins.	sol.	sol.	sol.	ins.	
Acetozone	sp. s.	sp. s.	m. s.	m. s.	.....	s. oils
*Acetphenetidin	1310	15	90	14		
Acid Abietic	ins.	sol.	sol.	sol.	.....	s. benzol
Agaric	sp. s.	10	sp. s.	sp. s.	.....	s. alkalies
*Arsenous	30–100	sp. s.	.....	.....	5	
*Benzoic	275	2.3	3	4.5	10	10 benzol
*Boric	18	18	ins.	.....	4	
*Bromauric	v. s.	v. s.				
Cacodylic	sol.	sol.				
Camphoric	125	v. s.	sol.	sol.		
*Carbolic	15	v. s.	v. s.	v. s.	v. s.	
Carminic	sol.	sol.	sp. s.	ins.		
*Chromic	v. s.	dec.	dec.	dec.	dec.	
Chrysophanic	ins.	sp. s.	sol.	sol.	.....	s. benzol
Cinnamic	3500	sol.	sol.			
*Citric	0.5	1.8	30	n. ins.	sol.	
Filicic	ins.	sol.	sol.	.....	.....	s. oils, alkalies
*Formic	v. s.	v. s.	sol.	.....	sol.	
*Gallic	8.7	4.6	100	sp. s.	10	
Glycero-phosph.	sol.	sol.				
Hippuric	600	v. s.				
*Hydriodic	a.	a.				
*Hydrobromic	a.	a.				
*Hydrochloric	a.	a.				
*Hydrocyanic	a.	a.				
*Hypophosphorous	a.	a.				
Iodic	sol.	sp. s.	sp. s.	.....	sp. s.	
*Lactic	a.	a.	a.	ins.		
Meconic	115	sol.				
*Nitric	a.	dec.				
*Oleic	ins.	sol.	sol.	sol.	sol.	s. oils
Osmic	sol.	sol.	sol.			
Oxalic	12	2.5	sp. s.	ins.	7.5	
*Phenylcinchon.	ins.	sp. s.	sp. s.			
*Phosphoric	a.	a.				
Phosphoric, glac.	v. s.	v. s.	ins.			

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Acid Picric	78	12	65	35	.....	10 benzene
*Pyrogallic	1.7	1.3	1.6			
*Salicylic	460	2.7	3	42	200	135 benzol
*Stearic	ins.	21	3	2		
Sozoidolic	sol.	sol.	.....	.....	sol.	
Sozolic	sol.	sol.	.....	.....	sol.	
Succinic	19	8	sol.	sp. s.		
Sulphanillic	sp. s.	ins.	ins.			
*Sulphuric	a.	a.				
*Tannic	0.34	0.23	sp. s.	sp. s.	1	sp. s. benzol
*Tartaric	0.75	3.3	sp. s.	sp. s.		
*Trichloracetic	0.1	v. s.	sol.			
Valeric	30	a.	a.	a.		
Acoin	17	v. s.	sol.	.....	.....	s. pet. eth.
*Aconitine	3200	28	65	v. s.	.....	s. benzol.
Nitrate	sp. s.	sol.				
Adrenalin	sp. s.	sp. s.	ins.	.....	.....	s. in fixed alkalies
Hydrochloride	sol.					
*Agar-agar	500	sp. s.				
Agathin	ins.	sol.	sol.			
Agurin	v. s.	sp. s.				
Airol(Bis.oxiodogal.)	ins.	ins.	ins.	ins.	sol.	ins. oils
Alantol	.....	sol.	sol.	sol.		
Albumin (egg)	sol.	ins.	ins.			
*Alcohol	a.	a.	a.	a.	a.	
Amyl	40	a.	a.	a.		
Methyl	a.	a.	a.			
Alphanaphthol	sp. s.	sol.	sol.	sol.		
Alphol	ins.	sol.	sol.			
*Aloin	65	10.75	664	4260		
*Alum (potassium)	9	ins.	.....	.....	sol.	
*Exsiccated	20	ins.				
*Aluminum Chlor.	5	4				
*Hydrox	ins.	ins.	ins.	ins.		
Salicylate	ins.	.....	.....	.....	.....	s. alkalies
*Sulphate	1	ins.	ins.	ins.		
Alumnol	1.5	sp. s.	ins.	.....	sol.	
Alypin	v. s.	sol.				
*Ammonium Benz.	10	35.5	.....	.....	8	
*Bromide	1.3	12	sp. s.			
*Carbonate	4	partly	.....	.....	5	
Citrate	sol.					
*Chloride	2.6	100	.....	.....	8	
*Hypophosphite	1	20				
*Iodide	0.6	3.7				
Nitrate	0.5	20				
Oxalate	sol.					
*Phosphate	4	ins.				
*Salicylate	1	3				
Sulphate	1.3	ins.				
*Valerate	0.3	0.6	sol.			
Amyl Acetate	sp. s.	a.	a.			
*Nitrite	sp. s.	a.	a.	a.		

TABLE OF SOLUBILITIES—*Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Amylene	sp. s.	a.	a.			
Hydrate	8	a.	a.	a.	a.	
Anæsthesin	sp. s.	sol.	sol.	sol.	.....	s. oils
*Anethol	sp. s.	2	sol.	sol.		
Anhalonine Hydroc.	sol.	sp. s.	sp. s.	sp. s.		
Anilin	33	a.	a.	a.		
Sulphate	sol.	sp. s.	ins.			
Anthrarobin	....	sp. s.	sp. s.	sp. s.		
Antifebrin	190	3.4	1.7	3.7	5	47 benzol
*Antim. and Pot. Tart	12	ins.	.....	.....	15	
*Sulphide	ins.	ins.				
Antinosin	sol.					
*Antipyrine	1	1.3	43	1		
Salicylate	200	n. s.	sol.			
Antiseptol	ins.	sol.	.....	sol.		
Apiol	sp. s.	sol.	sol.			
Apocodeine	ins.	sol.	sol.	sol.		
Hydrochloride	sol.	sol.				
Apolysin	25	sol.	.....	.....	sol.	
*Apomorphine Hydroc.	50	50	1864	3800	100	
Arbutin	8	16	ins.	ins.		
Argonin	sol.	ins.				
Argyrol	v. s.	ins.	.....	.....	sol.	ins. oils
Aristochin	ins.	sp. s.	sp. s.	sol.	sol.	
*Aristol	ins.	sp. s.	v. s.	v. s.	ins.	
*Arsenic Trioxide	30–100	sp. s.	.....	.....	5	
*Arsenous Iodide	12	28	sol.	sol.		
Asaprol	1.5	3				
Aseptol	sol.	sol.	.....	.....	sol.	
Aspidospermine	6000	48	106	sol.	.....	s. benzol
Aspirin	100	sol.	sol.	sol.		
*Atropine	455	2	25	1	27	
*Sulphate	0.4	5	3000	420	2.5	
*Balsam Peru	ins.	5	partly	sol.		
*Tolu	ins.	sol.	sol.	sol.		
Barium Acetate	1	100				
Bromide	1	v. s.				
Carbonate	ins.	ins.				
Chloride	2.5	ins.	.....	.....	10.3	
Dioxide	sp. s.					
Hydroxide	20					
Bebeerine	6000	5	13			
*Benzaldehyde	sp. s.	sol.	sol.	sol.		
Benzene	ins.	4	v. s.	v. s.		
*Benzin	ins.	6	v. s.	v. s.		
Benzonaphthol	ins.	sol.	sp. s.	33		
Benzopyrine	ins.	sol.	sol.			
Benzosol	sp. s.	sol.	sol.	sol.		
*Benzosulphinide	250	25	sp. s.	sp. s.		
Berberine	sp. s.	sp. s.	sp. s.			
Sulphate	sp. s.	sol.				
*Betaeucaine Hydroc.	30	35	.....	6		

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Betanaphthol	1000	0.8	1.3	17	sol.	s. alkalies
Benzoate	ins.	sol.	sol.	33		
Betol	ins.	sp. s.	sol.	.....	ins.	s. benzol.
*Bismuth and Am. Cit.	v. s.	sp. s.				
*Betanaphthol	ins.	sp. s.	sp. s.	sp. s.		
Citrate	ins.	ins.				
Hydroxide	ins.					
Oxiodogal	ins.	ins.	ins.	ins.	s.	ins. oils
Phenolsulphon	partly					
*Subcarbonate	ins.	ins.				
Subchloride	ins.	ins.				
*Subgallate	ins.	ins.	ins.	ins.		
*Subnitrate	ins.	ins.				
*Subsalicylate	ins.	ins.	ins.			
Tannate	ins.	ins.				
Boral	sol.					
Bromal	sp. s.	sol.	sol.	sol.	sol.	
Bromal Hydrate	sol.	sol.	sol.	sol.		
Brometone	sp. s.	sol.	sol.			
*Bromine	90	sol.	sol.			
*Bromoform	sp. s.	a.	a.	.....	80	
Brucine	750	2	sp. s.	sol.		
Sulphate	sol.	sol.				
Butyl Chloral Hydrate	30	1	sol.	20	1	
Cadmium Bromide	sol.	sol.				
Iodide	sol.	sol.				
*Caffeine	46	66	530	5.5	9	
Citrate	25	sol.				
*and Sod. Benzoate	1.1	30	.....	partly		
and Sod. Cinnam.	2	30				
and Sod. Salicyl.	2	50				
Calcium Acetate	sol.	sol.				
Benzoate	20					
Betanaph. Sulphon.	1.5	3				
Borate	ins.	.....	.....	.....	sol.	
*Bromide	0.7	1.3	ins.	ins.		
*Carbonate	ins.	ins.				
*Chloride	0.6	10	ins.	ins.		
Chlorinated	partly	partly				
*Glycero-phos	50	ins.	ins.			
*Hypophosphite	6.5	ins.				
Iodate	300	sp. s.				
Iodide	v. s.	v. s.				
*Lactate	20	sp. s.				
*Lactophosph.	sol.	sp. s.				
*Oxide	760					
Permanganate	v. s.					
Phenolsulphonate	sol.	sol.				
*Phosphate	ins.	ins.				
Salicylate	ins.					
Sulphate, dried	378	ins.				
Sulphite	800					
Thiosulphate	1					

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Calomelol	sol.	sol.	sol.			
*Camphor	sp. s.	v. s.	v. s.	v. s.	.....	s. oils
*Monobromated	sp. s.	6.5	1.6	0.5	sp. s.	
Canada Balsam	ins.	2.2				
Caramel	v. s.	sp. s.	ins.	ins.		
Carbon Disulphide	526	2	a.	a.		
Tetrachloride	ins.	a.	a.	a.	ins.	
Carmine	sp. s.	.....	.....	.....	.....	s. alkalies
Cephæline Hydroc.	sol.	sol.				
Cerium Oxalate	ins.	ins.	ins.	ins.	ins.	
Chinaphenin	sp. s.	sol.	sol.	sol.		
Chinaphthol	ins.	sp. s.				
Chinosol	v. s.	ins.	ins.			
*Chloral Hydrate	0.25	1.3	1.5	2	sol.	
Chloralformamide	18.7	1.3	v. s.	.....	v. s.	
Chloralimide	ins.	sol.	sol.	sol.		
Chloralose	200	sol.	sol.			
Chloretone	125	v. s.	v. s.	v. s.	7	s. oils
*Chloroform	20	a.	a.	a.	ins.	s. oils
*Chromium Trioxide	0.6	dec.	dec.	dec.	dec.	
*Chrysarobin	4812	385	16	12.5	.....	s. alkalies
Cinchonidine	1600	20	188	sol.		
Hydrochloride	sol.	sol.				
*Sulphate	65	90	4400	620		
Cinchonine	3760	116	526	163		
*Sulphate	60	12.5	3230	47		
Cinnamic Aldehyde	sp. s.	a.	a.	a.		
Citrophen	40					
*Cocaine	600	6.5	3.5	0.7	ins.	
*Hydrochloride	0.4	3.2	ins.	12.5	sol.	
*Codeine	120	2	18	0.5		
Hydrobromide	v. s.	sol.				
Hydrochloride	20					
*Phosphate	2.3	325	1875	4500		
*Sulphate	30	1280	ins.	ins.		
*Colchicine	22	v. s.	220	v. s.		
Collargol	20					
Coniine	90	v. s.	sol.	sol.		
Convallamarin	sol.	sol.	ins.	ins.		
*Copaiba	ins.	sol.	sol.	sol.		
Copper Acetate	15	135	ins.			
Chloride	v. s.	v. s.				
Nitrate	sol.	sol.				
Oleate	ins.	.....	sol.			
*Sulphate	2.5	500	ins.	.....	2.8	
Cornin	.....	sol.				
Cornutine	ins.	sol.	sol.	sol.		
*Cotarnine Hydroc.	sol.	sol.				
Cotoin	sp. s.	sol.	sol.	sol.		
Creosol	sp. s.	sol.	sol.			
Creosotal	ins.	sol.	sol.	sol.	.....	s. oils
*Creosote	140	a.	a.	a.	.....	s. oils
*Carbonate	ins.	sol.	.....	sol.		

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloro-form.	Glycerin.	Miscellaneous
Creosote Phosphate..	ins.	sol.	sol.			
Tannate..........	sol.	sol.	.....	.....	sol.	
*Cresol..............	50	a.	a.	a.	a.	
Iodide............	ins.	ins.	sp. s.	sol.		
*Cumarin............	sp. s.	10	sol.	sol.	.....	s. oils
Cymarin............	sp. s.	sol.	sp. s.	sol.		
Delphinine..........	sol.	sol.	sol.	sol.		
Dermatol...........	ins.	ins.	ins.	ins.		
Dextrin.............	sol.	ins.	ins.			
*Diacetyl morphine...	1700	31	100	1.4		
*Hydrochloride.....	2	sol.	ins.	ins.		
Digitalin...........	1000	sol.	sp. s.	sp. s.		
Digitoxin...........	sp. s.	sol.	sp. s.	sol.		
Diiodoform..........	ins.	sp. s.	sp. s.	sol.		
*Dionin.............	8	22	sp. s.	sp. s.		
*Diuretin............	1					
Dormiol............	ins.	a.	a.	a.		
*Duotal.............	ins.	48	13	1.5	sp. s.	
*Elaterin............	4250	262	318	22	ins.	
Emetine............	sp. s.	sol.	sp. s.	sol.		
*Hydrochloride.....	sol.	sol.				
Epicarin............	sp. s.	sol.	sol.	sp. s.	.....	s. soap sol.
Erythrol Tetranitrate	sp. s.	sol.	sol.			
*Ether..............	10	a.	a.	a.		
*Acetic............	9	a.	a.	a.		
Butyric...........	sp. s.	sol.				
Formic...........	sp. s.	sol.				
Ethyl Bromide.......	sp. s.	a.	a.	a.		
*Carbamate........	0.45	0.8	1.5	0.9	2.5	32 olive oil
*Chloride..........	sp. s.	v. s.	v. s.			
Iodide............	sp. s.	v. s.	sol.			
*Morphine Chloride.	8	22	sp. s.	sp. s.		
Ethylene Bromide...	ins.	a.				
Chloride..........	sp. s.	a.	a.	a.		
Eucaine A Hydrochl..	10	3				
Eucaine B Hydrochl..	30	35	.....	6	sol.	
*Eucalyptol..........	sp. s.	a.	a.	a.		
*Eugenol............	sp. s.	a.	a.	a.		
Euphorin............	sp. s.	sol.	sol.			
Euphthalmine Hydro.	v. s.	sp. s.	ins.			
Euquinine...........	sp. s.	sol.	sol.	sol.		
Europhen...........	ins.	sol.	sol.	sol.	ins.	
Exalgin	60	v. s.	10	v. s.		
Ferripyrine..........	5	v. s.	ins.			
Fluorescein..........	ins.	ins.	ins.			
*Gelatin.............	swells	ins.	ins.	ins.		
Gelsemine Hydrochl..	sol.					
Gelseminine Hydroc..	sol.	sp. s.				
Gland, Suprarenal...	partly					
*Glucose............	v. s.	sp. s.				
Glutol..............	ins.	ins.				
*Glycerin............	a.	a.	ins.	ins.		
Glycosal............	100	sol.	sp. s.	sp. s.		

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Glycyrrhizin	v. s.	sol.	ins.			
*Gold and Sodium Chl.	v. s.	partly	partly			
Bromide	sol.	sol.				
Chloride	v. s.	sol.	sol.			
*Guaiac	ins.	partly				
*Guaiacol	53	a.	a.	a.	0.8	
Benzoate	sp. s.	sol.	sp. s.	sol.		
*Carbonate	ins.	60	18	1	sp. s.	
Cinnamate	ins.	sol.	.....	sol.		
Phosphate	ins.	sol.	sol.	sol.		
Salicylate	ins.	sol.	sol.	sol.		
Hedonal	sp. s.	sol.	sol.	sol.		
Helleborein	sol.	sol.				
Helmitol	10	ins.	ins.			
Hematoxylin	sp. s.	sol.	sp. s.			
Heroine	1700	3.1	100	1.4	.....	6 benzene
Hydrochloride	2	sol.	ins.	ins.		
Hetocresol	ins.	sol.	sol.			
*Hexamethylenamine	1.5	12.5	320	sol.		
Holocaine Hydrochl.	50	sol.				
Homatropine	sp. s.	sol.	sol.	sol.		
*Hydrobromide	6	40	ins.	420		
Hydrargyrol	sol.	sp. s.	.....	.....	sol.	
*Hydrastine	ins.	170	175	1.4		
*Hydrochloride	v. s.	v. s.	sp. s.	sp. s.		
Hydrastinine	sp. s.	v. s.	135	3		
*Hydrochloride	v. s.	v. s.	1820	195		
Hydronaphthol	1000	sol.	sol.	sol.	sol.	
Hydroquinone	20	v. s.	v. s.			
Hyoscine	sp. s.	sol.	sol.	sol.		
*Hydrobromide	1.5	20	ins.	750		
Hyoscyamine	500	sol.	sol.	sol.		
*Hydrobromide	v. s.	2.5	2260	1.7		
Sulphate	v. s.	6.4	2500	2300		
Hypnal	30					
Hypnone	ins.	sol.	sol.	sol.		
Hyrgol	partly	ins.	ins.			
Ichthalbin	ins.	ins.	ins.			
Ichthargin	sol.	ins.	ins.	.....	sol.	
Ichthyol	sol.	sp. s.	sp. s.	.....	sol.	
Ingluvin	sol.					
*Iodine	2950	125	v. s.	v. s.	80	s. iodides
*Iodoform	9391	60	7.5	10	80	
Iodol	4900	9	1.5	105		
Iodophenin	ins.	sol.	.....	sp. s.		
Iron Acetate	4	sol.				
Albuminate	ins.	ins.				
Arsenate	ins.	ins.				
Benzoate	ins.					
Bromide	sol.	sol.	sol.			
Carbonate	ins.	ins.	ins.	ins.		
*Chloride	0.2	v. s.	sol.	.....	sol.	
Citrate	sol.	ins.	'			

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Iron Glycerophos.	2	ins.				
*Hypophosphite	2300	ins.	.....	.....	.....	s. sol. citrate
Iodide	v. s.	sol.	.....	.....	sol.	
*Lactate	40	ins.	.....	.....	.....	s. sol. citrate
Phosphate	ins.	ins.	ins.	ins.		
*Phosphate, sol.	sol.	ins.				
Pyrophos., sol.	sol.	ins.				
*Sulphate	1.4	ins.	ins.			
Valerate	ins.	sol.				
*and Am. Cit.	sol.	ins.				
and Am. Sulph.	2.7	ins.	ins.			
and Am. Tart.	sol.	ins.	.....	.....	sol.	
and Potas. Tart.	sol.	ins.				
*and Quin. Cit.	sol.	partly				
and Strych. Cit.	sol.	partly				
Itrol	sp. s.					
Kairine	6	20	ins.			
Kaolin	ins.	ins.	ins.	ins.		
*Kino	partly	sol.	sp. s.			
Lactophenin	350	8.5	sp. s.			
*Lanolin	ins.	sp. s.	sol.	sol.		
*Lard	ins.	sp. s.	sol.	sol.	ins.	
*Lead Acetate	1.4	38	.....	.....	sol.	
Carbonate	ins.	ins.				
Chloride	sp. s.	sp. s.				
*Iodide	1300	sp. s.				
Nitrate	1.85	ins.				
*Oxide	sp. s.	ins.				
*Lime	760	ins.				
*Chlorinated	partly	partly				
Sulphurated	sp. s.	ins.				
Lithium Benzoate	3	13				
*Bromide	0.6	v. s.	sol.			
*Carbonate	78	ins.				
Chloride	1.7	sol.				
*Citrate	1.4	ins.	ins.			
Phosphate	2540					
*Salicylate	v. s.	v. s.				
Sulphate	sol.	sol.				
Losophan	ins.	sp. s.	sol.	sol.		
Lysol	sol.	sol.	.....	sol.	sol.	
Magnesium Acetate	sol.	sol.				
Benzoate	20	20				
*Carbonate	sp. s.	ins.				
*Chloride	0.6	v. s.				
Lactate	30	ins.				
Citrate	sol.					
*Oxide	sp. s.	ins.				
Salicylate	10	sol.				
*Sulphate	1	ins.				
Sulphite	20	ins.				
Manganese Chloride	2.5	sol.				
*Dioxide	ins.	ins.				

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Manganese Hypophosphite	6.6	ins.				
Iodide	sol.					
Lactate	12	sp. s.				
*Sulphate	0.7	ins.				
Mannite	6	ins.	ins.			
Mastic	ins.	sp. s.	sol.	sol.		
*Menthol	sp. s.	v. s.	v. s.	v. s.	.....	s. oils
Mercuric Acetate	330	ins.	ins.			
Benzoate	sp. s.	ins.	ins.			
Bromide	80	sol.	sol.			
*Chloride	13.5	3.8	22	.....	12	
Cyanide	12.8	15	sp. s.			
*Iodide	ins.	115	120	910		
*Oxides (red, yellow)	ins.	ins.				
*Salicylate	sp. s.	sp. s.				
Succinide	75	300				
Sulphate (basic)	2000	ins.	ins.			
*Mercurous Chloride	ins.	ins.	ins.			
*Iodide	ins.	ins.	ins.			
*Merc., Ammoniated	sp. s.	ins.	ins.			
Colloidal	sp. s.	ins.	ins.			
Mesotan	sp. s.	sol.	sol.	sol.		
Metaldehyde	ins.	sol.	sol.			
Methacetin	300	sol.	.....	sol.	sol.	
*Methyl Salicylate	sp. s.	sol.	sol.	sol.		
Methylal	sol.	sol.				
Methylene Bichlor.	.....	sol.	sol.			
*Methylthionine Hyd.	v. s.	sol.	.....	sol.		
Metol	sol.					[water
*Morphine	3340	210	6250	1220	.....	100 lime
Acetate	2.25	21.6	.....	480	5.2	
*Hydrochloride	17.5	52	ins.	ins.	sol.	
Meconate	34	sol.				
*Sulphate	15.5	565	ins.	ins.		
Tartrate	11	sp. s.				
Naphthalene	ins.	13	v. s.	v. s.		
Naphthol (Alpha)	sp. s.	sol.	sol.			
*Naphthol (Beta)	1000	0.8	1.3	17	sol.	
Narceine	1200	800	ins.			
Narcotine	sp. s.	80	35	3		
Nirvanin	sol.	sol.				
Nosophen	ins.	sp. s.	sp. s.	sp. s.		
Novaspirin	sp. s.	sol.	sp. s.	sp. s.		
Novocain	1	30				
Orexine Hydrochl.	13	sol.	ins.			
Orphol	ins.	sp. s.				
Orthoform	sp. s.	6	50			
Ouabin	100	30	sp. s.	sp. s.		
*Ox Gall	v. s.	v. s.				
*Pancreatin	sol.	ins.				
Papaverine	ins.	sp. s.	sol.	sol.		
Hydrochloride	sp. s.	sol.	ins.	v. s.		
Sulphate	sol.	sol.	ins.	v. s.		

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Paraffin	ins.	ins.	sol.	sol.	.....	s. oils
*Paraform	sol.	sp. s.	sp. s.	.....	.....	s. alkalies
*Paraldehyde	8	a.	a.	a.	.....	s. oils
Pelletierine	v. s.	v. s.	v. s.	v. s.		
*Tannate	240	16	420	ins.		
Pental	ins.	a.	a.	a.		
*Pepsin	50	ins.	ins.	ins.		
Peronin	sp. s.	218	ins.	390		
*Petrolatum	ins.	sp. s.	sol.	sol.		
*Liquid	ins.	sp. s.	sol.	sol.		
*Phenacetin	1310	15	90	14		
Phenocoll	sp. s.	sol.				
Hydrochloride	16	sol.				
*Phenol	15	v. s.	v. s.	v. s.	v. s.	s. oils
*Salicylate	6670	6	v. s.	v. s.	.....	s. oils
*Phenolphthalein	ins.	13	70			
Phloridzin	sp. s.	4	sp. s.			
Phloroglucin	sol.	sol.	sol.			
*Phosphorus	ins.	350	80	25	400	
Physostigmine	sp. s.	v. s.	v. s.	30		
*Salicylate	75	16	250	6		
Sulphate	v. s.	v. s.	1200	v. s.		
Picrotoxin	330	13	.....	sol.		
Pilocarpine	sol.	v. s.	sol.	sol.		
*Hydrochloride	0.3	3	ins.	366		
*Nitrate	4	75	ins.	ins.		
Piperazine	sol.	sol.				
Piperin	ins.	15	36	1.7		
Pitch, Liquid	sp. s.	sol.	sol.	sol.		
Platinum Bichloride	sol.	sol.				
*Potassium Acetate	0.5	2.9	ins.			
*and Sod. Tart.	0.9	sp. s.				
Arsenite	v. s.	sp. s.				
Benzoate	v. s.					
*Bicarbonate	2.8	sp. s.	ins.			
Bisulphite	v. s.					
*Bitartrate	155	8820	ins.			
*Bromide	1.5	250	.....	.....	4.6	
*Carbonate	0.9	ins.	ins.			
*Chlorate	11.5	ins.	ins.	.....	28.2	
*Chloride	3	- ins.	ins.			
*Citrate	0.6	sp. s.	.....	.....	sol.	
Cyanide	2	sp. s.				
Dichromate	9	ins.				
Ferricyanide	4	sp. s.				
Ferrocyanide	4	ins.				
*Hydroxide	0.9	3	sp. s.	.....	2.5	
*Hypophosphite	0.6	9	ins.			
*Iodide	0.7	22	.....	.....	2	
*Nitrate	2.8	620				
Nitrite	v. s.					
*Permanganate	13.5	dec.				
Phosphate	sol.					

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Potassium Salicylate	sol.	sol.	ins.			
*Sulphate...........	10	ins.	ins.			
*Sulphide...........	2					
Sulphite...........	v. s.	sp. s.				
Tartrate...........	0.3	sp. s.				
Protargol............	1	.....	.....	.....	sol.	
Pyramidon..........	10	sol.	sol.			
Pyoktannin..........	75	12	ins.	sol.	50	
Pyridin..............	a.	a.	a.	a.		
*Pyrogallol...........	1.7	1.3	1.6			
Quinalgen...........	ins.	sp. s.				
Quinidine............	200	20	30			
Sulphate..........	110	8	sp. s.	19.5		
*Quinine.............	1560	0.8	1.9	1.1	158	
*and Urea Hydroc...	0.9	2.4				
Acetate..........	600	.....	.....	7		
Arsenite...........	sp. s.	15	25	8		
Benzoate..........	350					
*Bisulphate.........	9	23	2500	625	15	
Carbolate..........	400	80				
Citrate............	900	45				
*Dihydrochloride...	0.6	12	ins.	sp. s.		
Ferrocyanide......	sp. s.	sol.				
*Glycerophos.......	850	75	ins.	ins.		
*Hydrobromide.....	40	0.9	23	0.6	7	
*Hydrochloride.....	18	0.8	340	0.7	8	
*Hypophosphite.....	35	12.5	sp. s.	27		
Lactate...........	3	sol.				
Phosphate.........	784	sp. s.				
*Salicylate.........	14	14	160	25	13	
*Sulphate...........	725	107	sp. s.	400	30	
*Tannate...........	800	60	sp. s.	sp. s.		
*Valerate...........	sp. s.	6	a.			
Quinoline............	ins.	a.				
Tartrate...........	80	150	300			
*Resin...............	ins.	sol.	sol.	sol.		
*Resorcin............	0.9	0.9	v. s.	sp. s.	v. s.	
Retinol..............	ins.	ins.	sol.			
*Saccharin............	290	31	sp. s.	sp. s.	.....	s. alkalies
Safrol...............	sp. s.	1	a.	a.		
Salacetol............	2200	15	sol.	sol.		
*Salicin..............	23.5	88.5	ins.	ins.	8	
Salipyrine...........	200	sol.	sol.	sol.		
*Salol................	2333	5	v. s.	v. s.		
Salophen............	ins.	sol.	sol.			
Salvarsan............	v. s.					
Sanguinarine........	ins.	v. s.	v. s.	sol.		
Nitrate...........	sp. s.					
Sulphate..........	sol.	sol.				
*Santonin............	5300	43	110	1.7	18	
*Scopolamine Hydrochloride.........	1.5	20	ins.	sp. s.		
Shellac.............	ins.	sol.				

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Silver Acetate	100	sp. s.				
Bromide	ins.					
Chloride	ins.					
Citrate	3800					
Colloidal	50	500				
Cyanide	ins.	ins.				
Iodide	ins.	ins.				
Lactate	15					
*Nitrate	0.4	30	sp. s.			
*Oxide	sp. s.	ins.				
Phosphate	ins.					
Sulphate	200					
*Soap	sol.	sol.				
*Sodium Acetate	0.8	19				
*Arsenate	1.5	sp. s.	ins.	.....	2	
*Arsenate, Dried	3.1	ins.				
Arsenilate	6					
Arsenite	sol.	sp. s.				
*Benzoate	1.8	61	ins.	ins.	15	
*Benzosulphinide	1.2	50				
*Bicarbonate	10	ins.	.....	.....	12.4	
Bisulphite	3.5	70				
*Borate	15	ins.	.....	.....	1	
*Bromide	1.1	16				
*Cacodylate	0.5	2.5				
Carbonate	1.6	ins.	ins.	.....	1	
*Monohydr	3	ins.	ins.	.....	7	
Chlorate	1	100				
*Chloride	2.8	ins.	.....	.....	10	
*Citrate	1.3	ins.				
*Cyanide	v. s.					
Fluoride	25					
*Glycerophos	v. s.	ins.				
*Hydroxide	0.9	v. s.				
*Hypophosphite	1	25	ins.	.....	sol.	
Hyposulphite	0.35	ins.				
*Indigotin	sp. s.	ins.				
*Iodide	0.5	2				
Nitrate	1.1	100				
*Nitrite	1.5	sp. s.				
Oleate	10	20	sp. s.			
*Perborate	sol.					
*Phenolsulphon	4.2	140	.....	.....	5	
Phosphate	2.7	ins.				
Pyrophosphate	11.5	ins.				
*Salicylate	0.9	9.2	.....	.....	sol.	
Santoninate	3	12	ins.			
*Sulphate	2.8	ins.	.....	.....	sol.	
Sulphide	v. s.	sp. s.				
Sulphite	1	sp. s.	.....	.....	sol	
*Sulphocarbolate	4.2	140	.....	.....	5	
Tartrate	5	ins.				
*Theobrom. Salicyl.	1	sp. s.				
*Thiosulphate	0.5	ins.				

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
Solanine	ins.	400	sp. s.			
Sozoiodol	sol.	sol.	.....	.....	sol.	
Sparteine	sp. s.	v. s.	v. s.	v. s.		
*Sulphate	1.1	3	ins.	ins.		
*Spermaceti	ins.	sp. s.	sol.	sol.	.....	s. oils
Stovaine	v. s.	sol.	.....	.....	.....	s. wood alc.
*Strontium Bromide	0.35	v. s.	ins.			
*Carbonate	sp. s.					
Chloride	2	20				
*Iodide	0.2	sol.	sp. s.			
Lactate	4	sol.				
Nitrate	5	sp. s.				
*Salicylate	19	61				
Sulphate	7000	ins.				
*Strophanthin	v. s.	sol.	sp. s.	sp. s.		
*Strychnine	6420	136	5500	5	400	
Acetate	75	.....	.....	15		
*Glycerophos.	350	310	ins.	sp. s.		
Hydrochloride	35	60				
*Nitrate	42	150	ins.	105	50	
*Sulphate	32	81	ins.	220	sol.	
*Valerate	sp. s.	sol.	sp. s.	sol.		
Sucrol (Dulcin)	800	25				
*Suet	ins.	ins.	60			
*Sugar	0.5	170	ins.	ins.		
*Sugar, Milk	4.9	ins.	ins.	ins.		
*Sulphonal	365	60	64	11		
*Sulphonethylmethane	200	v. s.	v. s.			
*Sulphonmethane	365	60	64	11		
*Sulphur	ins.	sp. s.	sp. s.	sol.		
Iodide	sp. s.	partly	partly	.....	60	
*Talcum	ins.	ins.	ins.	ins.		
*Terebene	sp. s.	3				
*Terpin Hydrate	200	13	140	135		
Tetronal	450	sol.	sol.			
Thalline Sulphate	5	100	sp. s.	sp. s.		
Theobromine	sp. s.	sp. s.	sol.			
*Sodio-sal	1	sp. s.				
*Theophyllin	100	80	ins.			
Thiocol	sol.	sp. s.	ins.			
Thioform	ins.	ins.	ins.	.....	sol.	
Thiol	sol.	sol.	sp. s.	.....	sol.	
Thymoform	ins.	sol.	sol.	sol.	ins.	
*Thymol	1010	1	1.5	0.7	.....	s. cils
*Iodide	ins.	sp. s.	v. s.	v. s.	ins.	
Tolyantipyrine	10	sol.	ins.			
*Trinitrophenol	78	12	65	35	.....	10 benzene
*Trional	200	v. s.	v. s.			
Triphenin	2000	sol.	sol.			
Tumenol	ins.	sol.	sol.			
*Uranium Nitrate	1.2	sol.	sol.			
Urea	1	5	ins.	ins.		
*Urethane	0.45	0.8	1.5	0.9	2.5	

TABLE OF SOLUBILITIES — *Continued*

	Water.	Alcohol.	Ether.	Chloroform.	Glycerin.	Miscellaneous.
*Urotropine	1.5	125	320	sol.		
Salicylate	sol.	sol.				
*Vanillin	100	v. s.	v. s.	v. s.	v. s.	
*Veratrine, U. S. P.	1760	2.8	4.2	0.7		
Veronal	145	sol.	v. s.	sol.		
*Wax	ins.	sp. s.	sol.	sol.	.....	s. oils
*Wool Fat	ins.	sp. s.	sol.	sol.		
Xeroform	ins.	ins.				
*Zinc Acetate	2.3	30				
Bromide	v. s.	v. s.	sol.			
*Carbonate	ins.	ins.	ins.			
*Chloride	0.25	1.3	sol.	.....	2	
Cyanide	ins.	ins.				
Iodide	v. s.	v. s.	.....	.....	2.5	
Lactate	58	ins.				
Nitrate	v. s.	sol.				
*Oxide	ins.	ins.				
*Phenolsulphon.	1.6	1.8				
Phosphide	ins.	sol.				
Salicylate	20	v. s.	v. s.			
*Stearate	ins.	ins.	ins.			
*Sulphate	0.6	ins.	.....	.....	2.5	
Tannate	ins.	ins.				
*Valerate	70	22	sp. s.			

N. A. R. D. Prescription Pricing Schedule. (All figures are compounding fees only.)

How to Fix Price. This is Important. — The price of the prescription is the compounding fee + the cost of the container + twice the cost of the material. (Exception: When the cost of material is over $1.00 multiply cost by 1½ instead of 2; and further, if the cost is over 50¢ and under $1.00, adopt the following sliding scale: Cost 60¢, add $1.10; cost 70¢, add $1.20; cost 80¢, add $1.30; cost 90¢, add $1.40. These prices are based on a $1.50 per hour scale.

Example. — If the ingredients of a four-ounce mixture cost 12¢, compute price as follows: Compounding fee, 35¢, + container, 5¢, + twice cost of material, 25¢ (12 × 2) = total, 65¢.

1. *Liquid Prescriptions:* Minimum total charge, 25¢. All simple or compound mixtures, internal or external, dry or liquids and veterinary preparations are included in this table. Eye remedies, sprays for nose and throat, injections, etc., should be charged for as in the column, "Dose, ʒ ii–℥ i."

Quantity.	Dose, 1–5 ♏.	Dose, 10–25 ♏.	Dose, ʒss–ʒi.	Dose, ʒii–℥i.	Gargle and liniments only.
½ oz.	0.25	0.20	0.15	0.10	0.10
1 oz.	0.35	0.30	0.20	0.15	0.10
2 oz.	0.45	0.35	0.25	0.20	0.15
3 oz.	....	0.40	0.30	0.25	0.20
4 oz.	....	....	0.35	0.30	0.25
6 oz.	....	....	0.40	0.35	0.30
8 oz.	....	....	0.45	0.40	0.35
12 oz.	....	....	0.55	0.45	0.40
16 oz.	....	....	0.60	0.55	0.50
32 oz.	....	....	0.75	0.70	0.65

2. *Proprietaries:* Original package, regular retail price; when costing over $2, $4 or $8 per dozen, add 65 per cent to cost; when transferred to new container, add 15 per cent to regular retail price. When part of package is dispensed, double cost of amount used, add charge for container and one half of the compounding fee (see above).

3. *Dry Mixtures:* Minimum total charge, 15¢. These figures are compounding fees only.

PILLS, POWDERS, CAPSULES, WAFERS, ETC.

Number	4	6	8	10	12	15	20	24	30	40	50
Fee	15¢	20¢	25¢	30¢	35¢	40¢	45¢	50¢	60¢	75¢	90¢

Then every additional 25 up to one hundred, 25¢. After that 20¢ for every additional 25.

Where powders are prescribed by the ounce, charge as follows for compounding fee: 1 oz., 25¢.; 2 oz., 35¢; 3 oz., 40¢; 4 oz., 45¢; 6 oz., 50¢; 8 oz., 55¢; 12 oz., 65¢; 16 oz., 75¢, etc.

Proprietaries costing 20¢ per hundred or less, 10¢ for labeling and package, and 15¢ for 1 doz., 25¢ for 2 doz., 35¢ for 3 doz., 40¢ for 4 doz., then 5¢ for each additional dozen. Costing over 20¢ and under 50¢ per hundred, 10¢ for labeling and package, and 20¢ for 1 doz., 35¢ for 2 doz., 50¢ for 3 doz., 60¢ for 4 doz., then 10¢ for each additional dozen. When the wholesale price is over 50¢ per hundred, special rates may be made.

4. *Fatty Mixtures, Etc.*

OINTMENTS AND CERATES

½ oz.	0.20	2 oz.	0.35	4 oz.	0.55	8 oz.	0.75
1 oz.	0.25	3 oz.	0.45	6 oz.	0.65	16 oz.	1.00

SUPPOSITORIES, BOUGIES, ETC.

1	0.20	5	0.45	12	0.75	24	1.35
2	0.30	6	0.50	15	0.90	30	1.60
3	0.35	8	0.60	18	1.05	36	1.80
4	0.40	10	0.65	21	1.20		

5. *Veterinary:* Allow a discount of 25 per cent from the regular schedule on compounding fee only, except that for bulk powders the minimum charge be 25¢ for compounding.

6. *Household Remedies, Mixtures, Etc.:* Add regular retail price of ingredients (none less than 5¢) and charge for container. If any compounding is necessary, charge at rate of $1.50 per hour.

7. *Containers:* Pill and Powder Boxes 5¢. Ointment Boxes, 5¢. Ointment Jars, 1 oz., 5¢; 2–4 oz., 10¢; 8 oz., 15¢. Bottles, 8 oz. or less, 5¢; 10–16 oz., 10¢; 32 oz., 15¢; ½ gal., 20¢; 1 gal., 25¢. Glass Stoppered Bottles, three times the price of plain bottles.

8. *Marking Price on Prescriptions:* If a prescription or copy leaves your store, mark it with N. A. R. D. price, as follows:

P	H	A	R	M	O	C	I	S	T
1	2	3	4	5	6	7	8	9	0

9. *Admissible Changes:* If customer is poor, add a star (*) to price mark, showing you have gone below Schedule Price.

INDEX TO INCOMPATIBILITIES

References are to pages.

INDEX TO PRESCRIPTIONS

(References are to Prescriptions)

NAME	DATE DUE
A W Hewlett	Sept 9, 1917.
A. L. C.	MAY 14 1919
Dr. Crawford	OCT 30 1919
Orson M. Adams	MAY 17 1921
F. R. McCrea	MAY 20 1922
Pearl M. Smith	APR 28 '23
M. M. Robertson	APR 24 192
Haig M. Hosepian	MAY 3
Dr. Ells	MAY
	JAN 2 193
	MAR
John Passmore	
Seidenfeld	
Arthur Lae	
Fociluis P. Sudwe	
Fonlai	
Windsor C	